



2014 R410A

Service Handbook

Model

PURY-HP72, HP96T(Y)KMU-A(-H) PURY-HP144, HP192T(Y)SKMU-A(-H)

Safety Precautions

•Please read the following safety precautions carefully before installing the unit to ensure safety.

∴ WARNING

Indicates a risk of death or serious injury.



Indicates a risk of serious injury or structural damage.

- •Make sure that this manual is passed on to the end user to retain for future reference.
- •Retain this manual for future reference. When the unit is reinstalled or repaired, have this manual available to those who provide these services. Make sure that this manual is passed on to any future users.

All electric work must be performed by qualified personnel. Air tightness test must be performed by qualified personnel.

General Precautions

MARNING

Do not use refrigerant other than the type indicated in the manuals provided with the unit and on the nameplate. Doing so may cause the unit or pipes to burst, or result in explosion or fire during use, during repair, or at the time of disposal of the unit. It may also be in violation of applicable laws. MIT-SUBISHI ELECTRIC CORPORATION cannot be held responsible for malfunctions or accidents resulting from the use of the wrong type of refrigerant.

Do not install the unit in a place where large amounts of oil, steam, organic solvents, or corrosive gases, such as sulfuric gas, are present or where acidic/alkaline solutions or sprays containing sulfur are used frequently. These substances can compromise the performance of the unit or cause certain components of the unit to corrode, which can result in refrigerant leakage, water leakage, injury, electric shock, malfunctions, smoke, or fire.

Do not try to defeat the safety features of the unit or make unauthorized setting changes. Forcing the unit to operate the unit by defeating the safety features of the devices such as the pressure switch or the temperature switch, making unauthorized changes to the switch settings, or using accessories other than the ones recommended by Mitsubishi Electric may result in smoke, fire, or explosion.

To reduce the risk of shorting, current leakage, electric shock, malfunctions, smoke, or fire, do not splash water on electric parts.

To reduce the risk of electric shock, malfunctions, smoke or fire, do not operate the switches/buttons or touch other electrical parts with wet hands.

To reduce the risk of pipe burst and explosion, do not allow gas refrigerant and refrigerant oil to be trapped in the refrigerant circuit.

To reduce the risk of burns or frost bites, do not touch the refrigerant pipes or refrigerant circuit components with bare hands during and immediately after operation.

To reduce the risk of burns, do not touch any electrical parts with bare hands during or immediately after stopping operation.

To reduce the risk of injury from falling tools, keep children away while installing, inspecting, or repairing the unit.

Keep the space well ventilated. Refrigerant can displace air and cause oxygen starvation. If leaked refrigerant comes in contact with a heat source, toxic gas may be generated.

Always replace a fuse with one with the correct current rating. The use of improperly rated fuses or a substitution of fuses with steel or copper wire may result in bursting, fire or explosion.

To reduce the risk of electric shock, smoke, and fire due to infiltration of dust and water, properly install all required covers.

To reduce the risk of electric shock, smoke, and fire due to infiltration of dust and water, properly install all required terminal block covers and insulation sheets.

To reduce the risk of electric shock, smoke, and fire due to infiltration of dust and water, properly install all required covers and panels on the terminal box and control box.

To reduce the risk of injury from units falling or falling over, periodically check the installation base for damage.

Consult an authorized agency for the proper disposal of the unit. Refrigerant oil and refrigerant that may be left in the unit pose a risk of fire, explosion, or environmental pollution.

↑ CAUTION

To reduce the risk of fire or explosion, do not place flammable materials or use flammable sprays around the unit.

To reduce the risk of being caught in rotating parts, electric shock, and burns, do not operate the unit without all required panels and guards being installed.

To reduce the risk of injury, do not sit, stand, or place objects on the unit.

The unit described in this manual is not intended for use with food, animals, plants, precision instruments, or art work.

To reduce the risk of water leakage and malfunctions, do not turn off the power immediately after stopping operation. Leave the unit turned on for at least 5 minutes before turning off the power.

Do not install the unit over things that are vulnerable to water damage from condensation dripping.

To reduce the risk of injury, electric shock, and malfunctions, do not touch or allow cables to come in contact with the edges of components.

To reduce the risk of injury, do not touch the heat exchanger fins or sharp edges of components with bare hands.

Always wear protective gears when touching electrical components on the unit. Several minutes after the power is switched off, residual voltage may still cause electric shock.

To reduce the risk of electric shock and burns, always wear protective gear when working on units.

To reduce the risk of injury, do not insert fingers or foreign objects into air inlet/outlet grills. If the unit is left on a damaged base, it may fall and cause injury.

To reduce the risk of injury, always wear protective gear when working on units.

Do not release refrigerant into the atmosphere. Collect and reuse the refrigerant, or have it properly disposed of by an authorized agency. Refrigerant poses environmental hazards if released into the air.

Transportation and Installation

∴WARNING

Lift the unit by placing the slings at designated locations. Support the outdoor unit securely at four points to keep it from slipping and sliding. If the unit is not properly supported, it may fall and cause personal injury.

ACAUTION

To reduce the risk of injury, do not carry the product by the PP bands that are used on some packages.

To reduce the risk of injury, products weighing 20 kg or more should be carried by two or more people.

Installation

MARNING

Do not install the unit where there is a risk of leaking flammable gas.

If flammable gas accumulates around the unit, it may ignite and cause a fire or explosion.

To reduce the risk of injury from coming in contact with units, install units where they are not accessible to people other than maintenance personnel.

To reduce the risk of injury, properly dispose of the packing materials so that children will not play with them.

Properly dispose of the packing materials. Plastic bags pose suffocation hazard to children.

All drainage work should be performed by the dealer or qualified personnel according to the instructions detailed in the Installation Manual. Improper drainage work may cause water leakage and resultant damage to the furnishings.

Remove packing materials from the unit before operating the unit. Note that some accessories may be taped to the unit. Properly install all accessories that are required. Failing to remove the packing materials or failing to install required accessories may result in refrigerant leakage, oxygen deprivation, smoke, or fire. Consult your dealer and take appropriate measures to safeguard against refrigerant leakage and resultant oxygen starvation. An installation of a refrigerant gas detector is recommended.

Any additional parts must be installed by the dealer or qualified personnel. Only use the parts specified by Mitsubishi Electric. Installation by unauthorized personnel or use of unauthorized parts or accessories may result in water leakage, electric shock, or fire.

Take appropriate safety measures against wind gusts and earthquakes to prevent the unit from toppling over and causing injury.

To reduce the risk of injury from units falling or falling over, install the unit on a surface that is strong enough to support its weight.

To reduce the risk of injury from units falling or falling over, periodically check the installation base for damage.

⚠CAUTION

Do not install the unit over things that are vulnerable to water damage. Provide an adequate collective drainage system for the drain water from unit as necessary.

Do not install the unit over things that are vulnerable to water damage. When the indoor humidity exceeds 80% or if the drain water outlet becomes clogged, condensation may drip from the indoor unit onto the ceiling or floor.

To reduce the risk of damage to the unit and resultant electric leak and electric shock, keep small animals, snow, and rain water from entering the unit by closing the gap in the pipe and wire access holes.

To reduce the risk of rain water or drain water from entering the room and damaging the interior, drainage work must be performed by your dealer or qualified personnel according to the instructions detailed in the Installation Manual.

To reduce the risk of drain water overflow, install the unit horizontally, using a level.

Piping Work

MARNING

To reduce the risk of injury, including frost bites, that may result from being blasted with refrigerant, use caution when operating the refrigerant service valve. If refrigerant leaks out and comes in contact with an open flame, toxic gases may be generated.

To reduce the risk of refrigerant catching fire and causing burns, remove the refrigerant gas and the residual refrigerant oil in the pipes before heating them.

To reduce the risk of pipe damage, refrigerant leakage, and oxygen deprivation, use pipes that meet the pipe thickness specifications, which vary by the type of refrigerant used, pipe diameter, and pipe material.

To reduce the risk of pipe burst or explosion, evacuate the refrigerant circuit using a vacuum pump, and do not purge the system with refrigerant.

To reduce the risk of explosion and deterioration of refrigerant oil caused by chloride, do not use oxygen, flammable gas, or refrigerant that contains chloride as a pressurizing gas.

To prevent explosion, do not heat the unit with refrigerant gas in the refrigerant circuit.

To reduce the risk of refrigerant leakage and resultant oxygen deprivation, use the flare nut with holes that is supplied with the refrigerant service valve.

To reduce the risk of refrigerant leakage and resultant oxygen deprivation, use the flare nut that is supplied with the unit or its equivalent that meets applicable standards.

To reduce the risk of damage to the unit, and resultant refrigerant leakage and oxygen deprivation, tighten flare nuts to a specified torque.

To reduce the risk of oxygen deprivation and gas poisoning, check for gas leakage and keep fire sources away.

Insulate pipe connections after completing the air tightness test. Performing an air tightness test with the pipe being insulated may lead to failure to detect refrigerant leakage and cause oxygen deprivation.

To reduce the risk of pipe damage and resultant refrigerant leakage and oxygen deprivation, keep the field-installed pipes out of contact with the edges of components.

⚠CAUTION

To reduce the risk of pipe bursting and explosion due to abnormal pressure rise, do not allow any substances other than R410A (such as air) to enter the refrigerant circuit.

To reduce the risk of water leakage and resultant damage to the furnishings, drain piping work must be performed by your dealer or qualified personnel according to the instructions detailed in the Installation Manual.

To keep the ceiling and floor from getting wet due to condensation, properly insulate the pipes.

Wiring Work

∴WARNING

To reduce the risk of wire breakage, overheating, smoke, and fire, keep undue force from being applied to the wires. To reduce the risk of wire breakage, overheating, smoke, or fire, properly secure the cables in place and provide adequate slack in the cables so as not to stress the terminals. To reduce the risk of injury or electric shock, switch off the main power before performing electrical work.

All electric work must be performed by a qualified electrician according to the local regulations, standards, and the instructions detailed in the Installation Manual. Capacity shortage to the power supply circuit or improper installation may result in malfunction, electric shock, smoke, or fire.

To reduce the risk of electric shock, smoke, or fire, install an earth leakage breaker on the power supply to each unit.

To reduce the risk of electric shock, smoke, or fire, install an inverter circuit breaker on the power supply to each unit. (Applicable to inverter units only)

Use properly rated breakers and fuses (earth leakage breaker, local switch <switch + fuse>, no-fuse breaker). The use of a breaker with a breaking capacity greater than the specified capacity may cause electric shock, malfunctions, smoke, or fire.

⚠ CAUTION

To reduce the risk of current leakage, wire breakage, smoke, or fire, keep the wiring out of contact with the refrigerant pipes and other parts, especially sharp edges. Use properly rated breakers and fuses (inverter circuit breaker, local switch <switch + fuse>, no-fuse breaker). The use of a breaker with a breaking capacity greater than the specified capacity may cause electric shock, malfunctions, smoke, or fire. (Applicable to inverter units only)

To reduce the risk of current leakage, overheating, smoke, or fire, use properly rated cables with adequate current carrying capacity.

Proper grounding must be provided by a licensed electrician.

Do not connect the grounding wire to a gas pipe, water pipe, lightning rod, or telephone wire. Improper grounding may result in electric shock, smoke, fire, or malfunction due to electrical noise interference.

Relocation and Repairs

MARNING

To reduce the risk of refrigerant leakage, water leakage, injury, electric shock, and fire, units should only be moved or repaired by your dealer or qualified personnel.

To reduce the risk of wire shorting, electric leak, electric shock, smoke, or fire, do not perform maintenance work in the rain.

To reduce the risk of injury, electric shock, and fire, properly reinstall all removed components after completing repair work.

⚠CAUTION

To reduce the risk of wire shorting, electric shock, malfunctions, or fire, keep circuit boards dust free, and do not touch them with your hands or tools.

To reduce the risk of refrigerant and water leakage, check the pipe supports and insulation for damage during inspection or repair, and replace or repair the ones that are found to be deteriorated.

Additional Precautions

To avoid damage to the unit, use appropriate tools to install, inspect, or repair the unit.

To reduce the risk or malfunction, turn on the power at least 12 hours before starting operation, and leave the power turned on throughout the operating season.

Recover all refrigerant in the units, and dispose of it properly according to any applicable laws and regulations.

To reduce the risk of deterioration of refrigerant oil and compressor malfunctions caused by a refrigerant that contains chloride, such as R22, only use R410A.

Provide a maintenance access to allow for the inspection of pipes above the ceiling or the buried pipes.

Take appropriate measures against electrical noise interference when installing the air conditioners in hospitals or facilities with radio communication capabilities. Inverter, high-frequency medical, or wireless communication equipment as well as power generators may cause the air conditioning system to malfunction. Air conditioning system may also adversely affect the operation of these types of equipment by creating electrical noise.

To reduce the risk of damage to the unit, leave the valves on the unit closed until refrigerant charging is completed.

Place a wet towel on the refrigerant service valve before brazing the pipes to keep its temperature from rising above 120°C and damaging the surrounding equipment.

Direct the blazing torch flame away from the adjacent cables and sheet metal to keep them from being overheated and damaged.

Prepare tools for exclusive use with R410A. Do not use the following tools if they have been used with the conventional refrigerant (R22): gauge manifold, charging hose, refrigerant leak detector, check valve, refrigerant charge spout, vacuum gauge, and refrigerant recovery equipment. R410A does not contain chloride, so leak detectors for use with older types of refrigerants will not detect an R410A leak. Infiltration of the residual refrigerant, refrigerant oil, or water on these tools may cause the refrigerant oil in the new system to deteriorate or damage the compressor.

To reduce the risk of the vacuum pump oil backflowing into the refrigerant cycle and causing the refrigerant oil to deteriorate, use a vacuum pump with a check valve.

Have a set of tools for exclusive use with R410A. Consult your nearest Mitsubishi Electric Dealer.

Keep dust, dirt, and water off charging hose and flare tool. Infiltration of dust, dirt, or water into the refrigerant circuit may cause the refrigerant oil to deteriorate or damage the compressor.

Use refrigerant piping and couplings that meet the applicable standards. For refrigerant pipes, use pipes made of phosphorus deoxidized copper. Keep the inner and outer surfaces of pipes and couplings clean and free of such contaminants as sulfur, oxides, dust, dirt, shaving particles, oil, and moisture. Failure to follow these directions may result in the deterioration of refrigerant oil or compressor damage.

Store the piping materials indoors, and keep both ends of the pipes sealed until immediately before brazing. Keep elbows and other joints in plastic bags. Infiltration of dust, dirt, or water into the refrigerant circuit may cause the refrigerant oil to deteriorate or damage the compressor.

Apply ester oil, ether oil, or a small amount of alkyl benzene to flares and flanges. The use and accidental infiltration of mineral oil into the system may cause the refrigerant oil to deteriorate or damage the compressor.

To reduce the risk of oxidized film from entering the refrigerant pipe and causing the refrigerant oil to deteriorate or damaging the compressor, braze pipes under nitrogen purge.

Do not use the existing refrigerant piping. A large amount of chloride that is contained in the residual refrigerant and refrigerant oil in the existing piping may cause the refrigerant oil in the new unit to deteriorate or damage the compressor.

Charge refrigerant in the liquid state. If refrigerant is charged in the gas phase, the composition of the refrigerant in the cylinder will change, compromising the unit's performance. Do not use a charging cylinder. The use of a charging cylinder will change the composition of the refrigerant, compromising the unit's performance.

Charge the system with an appropriate amount of refrigerant in the liquid phase. Refer to the relevant sections in the manuals to calculate the appropriate amount of refrigerant to be charged. Refrigerant overcharge or undercharge may result in performance drop or abnormal stop of operation.

To reduce the risk of power capacity shortage, always use a dedicated power supply circuit.

To reduce the risk of both the breaker on the product side and the upstream breaker from tripping and causing problems, split the power supply system or provide protection coordination between the earth leakage breaker and no-fuse breaker.

Have a backup system, if failure of the unit has a potential for causing significant problems or damages.



Chapter	1	Check Before Servicing	
	1-1	Preparation for Piping Work	3
	1-2	Handling and Characteristics of Piping Materials, Refrigerant, and Refrigerant Oil	
	1-3	Working with Refrigerant Piping	
	1-4	Precautions for Wiring	15
Chapter	2	Restrictions	
	2-1	System Configurations	
	2-2	Types and Maximum Allowable Length of Cables	
	2-3	Switch Settings	
	2-4 2-5	M-NET Address Settings Demand Control Overview	
	2-6	System Connection Example	
	2-7	Example System with an MA Remote Controller	
	2-8	Example System with an ME Remote Controller	
	2-9	Example System with an MA and an ME Remote Controller	
	2-10	Restrictions on Refrigerant Pipes	51
Chapter	3	Major Components, Their Functions and Refrigerant Circ	cuits
	3-1	External Appearance and Refrigerant Circuit Components of Outdoor Unit	
	3-2	Outdoor Unit Refrigerant Circuit Diagrams	
	3-3	Functions of the Major Components of Outdoor Unit	
	3-4 3-5	Functions of the Major Components of Indoor Unit External Appearance and Refrigerant Circuit Components of BC Controller	
	3-6	BC Controller Refrigerant Circuit Diagrams	
	3-7	Functions of the Major Components of BC Controller	
Chapter	4	Electrical Components and Wiring Diagrams	
-	4-1	Outdoor Unit Circuit Board Arrangement	87
	4-2	Outdoor Unit Circuit Board Components	
	4-3	Outdoor Unit Electrical Wiring Diagrams	
	4-4	Transmission Booster Electrical Wiring Diagrams	
	4-5	BC Controller Circuit Board Arrangement	
	4-6	BC Controller Circuit Board Components	
	4-7	BC Controller Electrical Wiring Diagrams	104
Chapter	5	Control	
	5-1	Dipswitch Functions and Factory Settings	
	5-2	Outdoor Unit Control	
	5-3 5-4	BC Controller Control Operation Flowcharts	
.			
Chapter	6	Test Run	
	6-1	Read before Test Run	
	6-2	MA and ME Remote Controller Functions and Specifications	
	6-3 6-4	Making the Group and Interlock Settings from an ME Remote Controller Selecting Remote Controller Functions from an ME Remote Controller	
	6-5	Making Interlock Settings from an MA Remote Controller	
	6-6	Changing the Room Temperature Detection Position	
	6-7	Test Run Method	
	6-8	Operation Characteristics and Refrigerant Charge	161
	6-9	Evaluating and Adjusting Refrigerant Charge	
	6-10	The Following Symptoms Are Normal	
	6-11	Standard Operation Data (Reference Data)	167
Chapter	7	Troubleshooting Using Error Codes	
	7-1	Error Code and Preliminary Error Code Lists	
	7-2	Error Code Definitions and Solutions: Codes [0 - 999]	179

HWE13080 GB

CONTENTS

	7-3	Error Code Definitions and Solutions: Codes [1000 - 1999]	
	7-4	Error Code Definitions and Solutions: Codes [2000 - 2999]	184
	7-5	Error Code Definitions and Solutions: Codes [3000 - 3999]	191
	7-6	Error Code Definitions and Solutions: Codes [4000 - 4999]	192
	7-7	Error Code Definitions and Solutions: Codes [5000 - 5999]	210
	7-8	Error Code Definitions and Solutions: Codes [6000 - 6999]	223
	7-9	Error Code Definitions and Solutions: Codes [7000 - 7999]	239
Chapter	8	Troubleshooting Based on Observed Symptoms	
	8-1	MA Remote Controller Problems	251
	8-2	ME remote Controller Problems	255
	8-3	Refrigerant Control Problems	259
	8-4	Checking Transmission Waveform and for Electrical Noise Interference	264
	8-5	Pressure Sensor Circuit Configuration and Troubleshooting Pressure Sensor Problems	267
	8-6	Troubleshooting Solenoid Valve Problems	269
	8-7	Troubleshooting Outdoor Unit Fan Problems	272
	8-8	Troubleshooting LEV Problems	273
	8-9	Troubleshooting Problems with Major Components on BC Controller	277
	8-10	Troubleshooting Inverter Problems (TKMU)	
	8-11	Troubleshooting Inverter Problems (YKMU)	298
	8-12	Control Circuit (TKMU)	307
	8-13	Control Circuit (YKMU)	309
	8-14	Measures for Refrigerant Leakage	311
	8-15	Compressor Replacement Instructions	
	8-16	Solenoid Valve Block and Check Valve Replacement Instructions	
	8-17	·	
	8-18	Troubleshooting Problems Using the LED Status Indicators on the Outdoor Unit	322
Chapter	9	LED Status Indicators on the Outdoor Unit Circuit Board	
	9-1	LED Status Indicators	325
	9-2	LED Status Indicators Table	328

HWE13080 GB

Chapter 1 Check Before Servicing

1-1	Preparation for Piping Work	3
1-1-1	Read before Servicing	
1-1-2	Tool Preparation	4
1-2	Handling and Characteristics of Piping Materials, Refrigerant, and Refrigerant Oil	5
1-2-1	Piping Materials	5
1-2-2	Storage of Piping Materials	7
1-2-3	Pipe Processing	7
1-2-4	Characteristics of the New and Conventional Refrigerants	8
1-2-5	Refrigerant Oil	9
1-3	Working with Refrigerant Piping	10
1-3-1	Pipe Brazing	10
1-3-2	Air Tightness Test	11
1-3-3	Vacuum Drying	12
1-3-4	Refrigerant Charging	14
1-4	Precautions for Wiring	15

1-1 Preparation for Piping Work

1-1-1 Read before Servicing

1. Check the type of refrigerant used in the system to be serviced.

Refrigerant Type

Multi air conditioner for building application CITY MULTI H2i (Hyper Heating Inverter) R2 TKMU-A-H, YKMU-A series: R410A

2. Check the symptoms exhibited by the unit to be serviced.

Refer to this service handbook for symptoms relating to the refrigerant cycle.

- 3. Thoroughly read the safety precautions at the beginning of this manual.
- **4.** Preparing necessary tools: Prepare a set of tools to be used exclusively with each type of refrigerant. For information about the correct use of tools, refer to the following page(s). [1-1-2 Tool Preparation](page 4)
- 5. Verification of the connecting pipes: Verify the type of refrigerant used for the unit to be moved or replaced.
 - •Use refrigerant pipes made of phosphorus deoxidized copper. Keep the inner and outer surfaces of the pipes clean and free of such contaminants as sulfur, oxides, dust, dirt, shaving particles, oil, and water.
 - •These types of contaminants inside the refrigerant pipes may cause the refrigerant oil to deteriorate.
- 6. If there is a leak of gaseous refrigerant and the remaining refrigerant is exposed to an open flame, a poisonous gas hydrofluoric acid may form. Keep workplace well ventilated.



- Install new pipes immediately after removing old ones to keep moisture out of the refrigerant circuit.
- *The use of refrigerant that contains chloride, such as R22, will cause the refrigerating machine oil to deteriorate.

1-1-2 Tool Preparation

Prepare the following tools and materials necessary for installing and servicing the unit.

Tools for use with R410A (Adaptability of tools that are for use with R22 or R407C)

1. To be used exclusively with R410A (not to be used if used with R22 or R407C)

Tools/Materials	Use	Notes	
Gauge Manifold	Evacuation and refrigerant charging	Higher than 5.09MPa[738psi] on the high-pressure side	
Charging Hose	Evacuation and refrigerant charging	The hose diameter is larger than the conventional model.	
Refrigerant Recovery Cylinder	Refrigerant recovery		
Refrigerant Cylinder	Refrigerant charging	The refrigerant type is indicated. The cylinder is pink.	
Charging Port on the Refrigerant Cylinder	Refrigerant charging	The charge port diameter is larger than that of the current port.	
Flare Nut	Connection of the unit with the pipes	Use Type-2 Flare nuts.	

2. Tools and materials that may be used with R410A with some restrictions

Tools/Materials	Use	Notes
Gas Leak Detector	Gas leak detection	The ones for use with HFC refrigerant may be used.
Vacuum Pump	Vacuum drying	May be used if a check valve adapter is attached.
Flare Tool	Flare processing	Flare processing dimensions for the piping in the system using the new refrigerant differ from those of R22. Refer to the following page(s). [1-2-1 Piping Materials](page 5)
Refrigerant Recovery Equipment	Refrigerant recovery	May be used if compatible with R410A.

3. Tools and materials that are used with R22 or R407C that may also be used with R410A

Tools/Materials	Use	Notes
Vacuum Pump with a Check Valve	Vacuum drying	
Bender	Bending pipes	
Torque Wrench	Tightening flare nuts	Only the flare processing dimensions for pipes that have a diameter of ø12.7 (1/2") and ø15.88 (5/8") have been changed.
Pipe Cutter	Cutting pipes	
Welder and Nitrogen Cylinder	Welding pipes	
Refrigerant Charging Meter	Refrigerant charging	
Vacuum Gauge	Vacuum level check	

4. Tools and materials that must not be used with R410A

Tools/Materials	Use	Notes
Charging Cylinder	Refrigerant charging	Prohibited to use

Tools for R410A must be handled with special care to keep moisture and dust from infiltrating the cycle.

1-2 Handling and Characteristics of Piping Materials, Refrigerant, and Refrigerant Oil

1-2-1 Piping Materials

Do not use the existing piping!

1. Copper pipe materials

O-material (Annealed)	Soft copper pipes (annealed copper pipes). They can easily be bent with hands.
1/2H-material (Drawn)	Hard copper pipes (straight pipes). They are stronger than the O-material (Annealed) at the same radial thickness.

- •The distinction between O-materials (Annealed) and 1/2H-materials (Drawn) is made based on the strength of the pipes themselves.
- •O-materials (Annealed) can easily be bent with hands.
- •1/2H-materials (Drawn) are considerably stronger than O-material (Annealed) at the same thickness.

2. Types of copper pipes

Maximum working pressure	Refrigerant type	
3.45 MPa [500psi]	R22, R407C etc.	
4.30 MPa [624psi]	R410A etc.	

3. Piping materials/Radial thickness

Use refrigerant pipes made of phosphorus deoxidized copper.

The operation pressure of the units that use R410A is higher than that of the units that use R22.

Use pipes that have at least the radial thickness specified in the chart below.

(Pipes with a radial thickness of 0.7 mm or less may not be used.)

Pipe size (mm[in])		Radial thickness (mm)	Туре	
ø6.35	[1/4"]	0.8t		
ø9.52	[3/8"]	0.8t	O-material (Annealed)	
ø12.7	[1/2"]	0.8t	- O-material (Armealed)	
ø15.88	[5/8"]	1.0t]	
ø19.05	[3/4"]	1.0t		
ø22.2	[7/8"]	1.0t]	
ø25.4	[1"]	1.0t		
ø28.58	[1-1/8"]	1.0t	1/2H-material, H-material (Drawn)	
ø31.75	[1-1/4"]	1.1t		
ø34.93	[1-3/8"]	1.1t]	
ø41.28	[1-5/8"]	1.2t]	

[•]The pipes in the system that uses the refrigerant currently on the market are made with O-material (Annealed), even if the pipe diameter is less than ø19.05 (3/4"). For a system that uses R410A, use pipes that are made with 1/2H-material (Drawn) unless the pipe diameter is at least ø19.05 (3/4") and the radial thickness is at least 1.2t.

[•]The figures in the radial thickness column are based on the Japanese standards and provided only as a reference. Use pipes that meet the local standards.

4. Thickness and refrigerant type indicated on the piping materials

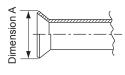
Ask the pipe manufacturer for the symbols indicated on the piping material for new refrigerant.

5. Flare processing (O-material (Annealed) and OL-material only)

The flare processing dimensions for the pipes that are used in the R410A system are larger than those in the R22 system.

Flare processing dimensions (mm[in])

Pipe size (mm[in])		A dimension (mm)	
		R410A	R22, R407C
ø6.35	[1/4"]	9.1	9.0
ø9.52	[3/8"]	13.2	13.0
ø12.7	[1/2"]	16.6	16.2
ø15.88	[5/8"]	19.7	19.4
ø19.05	[3/4"]	24.0	23.3



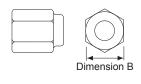
If a clutch-type flare tool is used to flare the pipes in the system using R410A, the length of the pipes must be between 1.0 and 1.5 mm. For margin adjustment, a copper pipe gauge is necessary.

6. Flare nut

The flare nut type has been changed to increase the strength. The size of some of the flare nuts have also been changed.

Flare nut dimensions (mm[in])

Pipe size (mm[in])		B dimension (mm)	
		R410A	R22, R407C
ø6.35	[1/4"]	17.0	17.0
ø9.52	[3/8"]	22.0	22.0
ø12.7	[1/2"]	26.0	24.0
ø15.88	[5/8"]	29.0	27.0
ø19.05	[3/4"]	36.0	36.0



The figures in the radial thickness column are based on the Japanese standards and provided only as a reference. Use pipes that meet the local standards.

1-2-2 Storage of Piping Materials

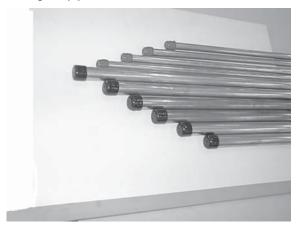
1. Storage location





Store the pipes to be used indoors. (Warehouse at site or owner's warehouse) If they are left outdoors, dust, dirt, or moisture may infiltrate and contaminate the pipe.

2. Sealing the pipe ends





Both ends of the pipes should be sealed until just before brazing. Keep elbow pipes and T-joints in plastic bags.

The new refrigerator oil is 10 times as hygroscopic as the conventional refrigerating machine oil (such as Suniso) and, if not handled with care, could easily introduce moisture into the system. Keep moisture out of the pipes, for it will cause the oil to deteriorate and cause a compressor failure.

1-2-3 Pipe Processing

Use a small amount of ester oil, ether oil, or alkylbenzene to coat flares and flanges.

Note

- •Use a minimum amount of oil.
- •Use only ester oil, ether oil, and alkylbenzene.

1-2-4 Characteristics of the New and Conventional Refrigerants

1. Chemical property

As with R22, the new refrigerant (R410A) is low in toxicity and chemically stable nonflammable refrigerant. However, because the specific gravity of vapor refrigerant is greater than that of air, leaked refrigerant in a closed room will accumulate at the bottom of the room and may cause hypoxia.

If exposed to an open flame, refrigerant will generate poisonous gases. Do not perform installation or service work in a confined area.

	New Refrigera	ant (HFC type)	Conventional Refriger- ant (HCFC type)
	R410A	R407C	R22
	R32/R125	R32/R125/R134a	R22
Composition (wt%)	(50/50)	(23/25/52)	(100)
Type of Refrigerant	Pseudo-azeotropic Refrigerant	Non-azeotropic Refrigerant	Single Refrigerant
Chloride	Not included	Not included	Included
Safety Class	A1/A1	A1/A1	A1
Molecular Weight	72.6	86.2	86.5
Boiling Point (°C/°F)	-51.4/-60.5	-43.6/-46.4	-40.8/-41.4
Steam Pressure (25°C,MPa/77°F,psi) (gauge)	1.557/226	0.9177/133	0.94/136
Saturated Steam Density (25°C,kg/m³/77°F,psi)	64.0	42.5	44.4
Flammability	Nonflammable	Nonflammable	Nonflammable
Ozone Depletion Coefficient (ODP)*1	0	0	0.055
Global Warming Coefficient (GWP)*2	1730	1530	1700
Refrigerant Charging Method	Refrigerant charging in the liquid state	Refrigerant charging in the liquid state	Refrigerant charging in the gaseous state
Replenishment of Refrigerant after a Refrigerant Leak	Available	Available	Available

^{*1} When CFC11 is used as a reference

2. Refrigerant composition

R410A is a pseudo-azeotropic HFC blend and can almost be handled the same way as a single refrigerant, such as R22. To be safe, however, draw out the refrigerant from the cylinder in the liquid phase. If the refrigerant in the gaseous phase is drawn out, the composition of the remaining refrigerant will change and become unsuitable for use.

If the refrigerant leaks out, it may be replenished. The entire refrigerant does not need to be replaced.

3. Pressure characteristics

The pressure in the system using R410A is 1.6 times as great as that in the system using R22.

	Pressure (gauge)					
Temperature (°C/°F)	R410A	R407C	R22			
	MPa/psi	MPa/psi	MPa/psi			
-20/-4	0.30/44	0.18/26	0.14/20			
0/32	0.70/102	0.47/68	0.40/58			
20/68	1.34/194	0.94/136	0.81/117			
40/104	2.31/335	1.44/209	1.44/209			
60/140	3.73/541	2.44/354	2.33/338			
65/149	4.17/605	2.75/399	2.60/377			

^{*2} When CO₂ is used as a reference

1-2-5 Refrigerant Oil

1. Refrigerating machine oil in the HFC refrigerant system

HFC type refrigerants use a refrigerating machine oil different from that used in the R22 system. Note that the ester oil used in the system has properties that are different from commercially available ester oil.

Refrigerant	Refrigerating machine oil
R22	Mineral oil
R407C	Ester oil
R410A	Ester oil

2. Effects of contaminants*1

Refrigerating machine oil used in the HFC system must be handled with special care to keep contaminants out. The table below shows the effect of contaminants in the refrigerating machine oil on the refrigeration cycle.

3. The effects of contaminants in the refrigerating machine oil on the refrigeration cycle.

Cau	Cause Symptoms		Effects on the refrigerant cycle		
Water infiltration			Frozen expansion valve and capillary tubes	Clogged expansion valve and capillary tubes Poor cooling performance Compressor overheat Motor insulation failure Burnt motor Coppering of the orbiting scroll Lock Burn-in on the orbiting scroll	
		Hydrolysis	Sludge formation and adhesion Acid generation Oxidization Oil degradation		
Air infiltration Oxidization		Oxidization			
Dust, dirt		Adhesion to expansion valve and capillary tubes		Clogged expansion valve, capillary tubes, and drier Poor cooling performance Compressor overheat	
Infiltration of contaminants	militration of process		ontaminants into the com-	Burn-in on the orbiting scroll	
	Mineral oil etc.	Sludge formation and adhesion		Clogged expansion valve and capillary tubes Poor cooling performance Compressor overheat	
		Oil degradation	1	Burn-in on the orbiting scroll	

^{*1.} Contaminants is defined as moisture, air, processing oil, dust/dirt, wrong types of refrigerant, and refrigerating machine oil.

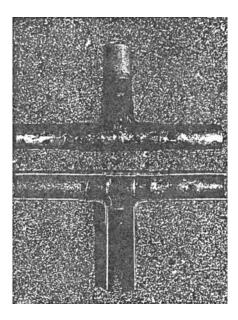
1-3 Working with Refrigerant Piping

1-3-1 Pipe Brazing

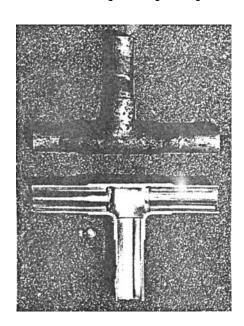
No changes have been made in the brazing procedures. Perform brazing with special care to keep foreign objects (such as oxide scale, water, and dust) out of the refrigerant system.

Example: Inside the brazed connection

Use of no inert gas during brazing



Use of inert gas during brazing



1. Items to be strictly observed

- •Do not conduct refrigerant piping work outdoors if raining.
- •Use inert gas during brazing.
- •Use a brazing material (BCuP-3) that requires no flux when brazing between copper pipes or between a copper pipe and copper coupling.
- •If installed refrigerant pipes are not immediately connected to the equipment, then braze and seal both ends.

2. Reasons

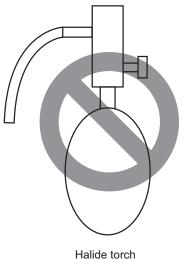
- •The new refrigerating machine oil is 10 times as hygroscopic as the conventional oil and is more likely to cause unit failure if water infiltrates into the system.
- •Flux generally contains chloride. Residual flux in the refrigerant circuit will cause sludge to form.

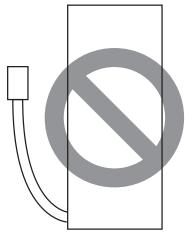
3. Notes

Do not use commercially available antioxidants because they may cause the pipes to corrode or refrigerating machine oil to deteriorate.

1-3-2 Air Tightness Test

No changes have been made in the detection method. Note that a refrigerant leak detector for R22 will not detect an R410A leak.





torch R22 leakage detector

1. Items to be strictly observed

- •Pressurize the equipment with nitrogen up to the design pressure (4.15MPa[601psi]), and then judge the equipment's air tightness, taking temperature variations into account.
- •Refrigerant R410A must be charged in its liquid state (vs. gaseous state).

2. Reasons

- •Oxygen, if used for an air tightness test, poses a risk of explosion. (Only use nitrogen to check air tightness.)
- •Refrigerant R410A must be charged in its liquid state. If gaseous refrigerant in the cylinder is drawn out first, the composition of the remaining refrigerant in the cylinder will change and become unsuitable for use.

3. Notes

Procure a leak detector that is specifically designed to detect an HFC leak. A leak detector for R22 will not detect an HFC(R410A) leak.

1-3-3 Vacuum Drying







(Photo2) 14010

Recommended vacuum gauge: ROBINAIR 14010 Thermistor Vacuum Gauge

1. Vacuum pump with a reverse-flow check valve (Photo1)

To prevent the vacuum pump oil from flowing into the refrigerant circuit during power OFF or power failure, use a vacuum pump with a reverse-flow check valve.

A reverse-flow check valve may also be added to the vacuum pump currently in use.

2. Standard of vacuum degree (Photo 2)

Use a vacuum pump that attains 0.5Torr(65Pa) or lower degree of vacuum after 5 minutes of operation, and connect it directly to the vacuum gauge. Use a pump well-maintained with an appropriate lubricant. A poorly maintained vacuum pump may not be able to attain the desired degree of vacuum.

3. Required precision of vacuum gauge

Use a vacuum gauge that registers a vacuum degree of 5Torr(650Pa) and measures at intervals of 1Torr(130Pa). (A recommended vacuum gauge is shown in Photo2.)

Do not use a commonly used gauge manifold because it cannot register a vacuum degree of 5Torr(650Pa).

4. Evacuation time

- •After the degree of vacuum has reached 5Torr(650Pa), evacuate for an additional 1 hour. (A thorough vacuum drying removes moisture in the pipes.)
- •Verify that the vacuum degree has not risen by more than 1Torr(130Pa) 1hour after evacuation. A rise by less than 1Torr(130Pa) is acceptable.
- •If the vacuum is lost by more than 1Torr(130Pa), conduct evacuation, following the instructions in section 6. Special vacuum drying.

5. Procedures for stopping vacuum pump

To prevent the reverse flow of vacuum pump oil, open the relief valve on the vacuum pump side, or draw in air by loosening the charge hose, and then stop the operation.

The same procedures should be followed when stopping a vacuum pump with a reverse-flow check valve.

6. Special vacuum drying

- •When 5Torr(650Pa) or lower degree of vacuum cannot be attained after 3 hours of evacuation, it is likely that water has penetrated the system or that there is a leak.
- •If water infiltrates the system, break the vacuum with nitrogen. Pressurize the system with nitrogen gas to 0.5kgf/cm²G(0.05MPa) and evacuate again. Repeat this cycle of pressurizing and evacuation either until the degree of vacuum below 5Torr(650Pa) is attained or until the pressure stops rising.
- •Only use nitrogen gas for vacuum breaking. (The use of oxygen may result in an explosion.)

7. Triple Evacuation

The method below can also be used to evacuate the system.

- •Evacuate the system to 4,000 microns from both service valves. System manifold gauges must not be used to measure vacuum. A micron gauge must be used at all times. Break the vacuum with Nitrogen (N2) into the discharge service valve to 0 PSIG
- •Evacuate the system to 1,500 microns from the suction service valve. Break the vacuum with Nitrogen (N2) into the discharge service valve to 0 PSIG.
- •Evacuate the system to 500 microns. System must hold the vacuum at 500 microns for a minimum of 1 hour.
- Conduct a rise test for a minimum of 30 minutes

8. Notes

*To evacuate air from the entire system

Applying a vacuum through the check joints at the refrigerant service valve on the high and low pressure sides (BV1 and 2) is not enough to attain the desired vacuum pressure.

Be sure to apply a vacuum through the check joints at the refrigerant service valve on the high and low pressure sides (BV1 and 2) and also through the check joints on the high and low pressure sides (CJ1 and 2).

*To evacuate air only from the outdoor units

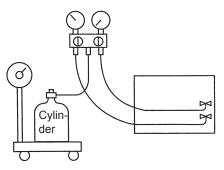
Apply a vacuum through the check joints on the high and low pressure sides (CJ1, and 2).

•To evacuate air from the indoor units and extension pipes

Apply a vacuum through the check joints at the refrigerant service valve on the high and low pressure sides (BV1 and 2).

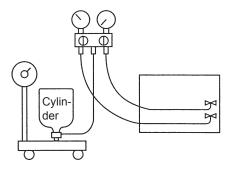
1-3-4 Refrigerant Charging

Cylinder with a siphon

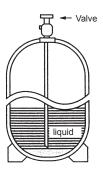


Cylinder color R410A is pink.

Cylinder without a siphon



Refrigerant charging in the liquid state





1. Reasons

R410A is a pseudo-azeotropic HFC blend (boiling point R32=-52°C[-62°F], R125=-49°C[-52°F]) and can almost be handled the same way as a single refrigerant, such as R22. To be safe, however, draw out the refrigerant from the cylinder in the liquid phase. If the refrigerant in the gaseous phase is drawn out, the composition of the remaining refrigerant will change and become unsuitable for use.

2. Notes

When using a cylinder with a siphon, refrigerant is charged in the liquid state without the need for turning it upside down. Check the type of the cylinder on the label before use.

If the refrigerant leaks out, it may be replenished. The entire refrigerant does not need to be replaced. (Charge refrigerant in the liquid state.)

Refer to the following page(s).[8-14 Measures for Refrigerant Leakage](page 311)

1-4 Precautions for Wiring

- •Control boxes house high-voltage and high-temperature electrical parts.
- •They may still remain energized or hot after the power is turned off.
- •When opening or closing the front cover of the control box, keep out of contact with the internal parts.

Before inspecting the inside of the control box, turn off the power, leave the unit turned off for at least 10 minutes, and check that the voltage of the electrolytic capacitor (inverter main circuit) has dropped to 20 VDC or less.

It will take approximately 10 minutes until the voltage is discharged after power off.

Disconnect the outdoor unit fan board connector (CNINV) before performing maintenance work.

Before connecting or disconnecting the connector, check that the outdoor unit fan is stopped and that the voltage of the main circuit capacitor has dropped to 20 VDC or below.

If the outdoor unit fan is rotated by external forces such as strong winds, the main circuit capacitor can be charged and cause an electric shock.

Refer to the wiring nameplate for details.

Reconnect the connector (CNINV) to the fan board after completion of maintenance work.

- •When the unit is turned on, the compressor will remain energized even when it is stopped to vaporize the liquid refrigerant that accumulates in the compressor.
- •Before connecting wiring to TB7, check that the voltage has dropped below 20 VDC.
- •When a system controller is connected to the centralized control transmission cable to which power is supplied from the outdoor unit (power jumper on the outdoor unit is connected to CN40), be aware that power can be supplied to the centralized control transmission and the system controller may detect an error and send an error notice if the outdoor unit fan is rotated by external forces, such as strong winds, even when power to the outdoor unit is turned off.
- •When replacing the internal electrical components of the control box, tighten the screws to the recommended tightening torque as specified below.

Recommended tightening torque for the internal electrical components of the control box

Screw	Recommended tightening torque (N·m)
M3	0.69
M4	1.47
M5	2.55
M6	2.75
M8	6.20

- *1 When replacing semiconductor modules (e.g., diode stack, IPM, INV board (with IPM), fan board (with IPM)), apply heatsink silicone evenly to the mounting surface of the semiconductor module (or the semiconductor module on the back of the circuit board). Next, tighten the screws holding the semiconductor module to one-third of the specified torque, and then tighten the screws to the specified torque.
- *2 Deviating from the recommended tightening torque may cause damage to the unit or its parts.

Take the following steps to ensure that the screws are properly tightened.

1) Ensure that the spring washers are parallel to the terminal block.

Even if the tightening torque is observed, if the washers are not parallel to the terminal block, then the semiconductor module is not installed properly.



- 2) Check the wires are securely fastened to the screw terminals.
 - •Screw the screws straight down so as not to damage the screw threads.

Hold the two round terminals back to back to ensure that the screw will screw down straight.

*After tightening the screw, mark a line through the screw head, washer, and terminals with a permanent marker.

Example



Power supply terminal block, indoor-outdoor transmission line terminal block, and centralized controller transmission line

Poor contact caused by loose screws may result in overheating and fire. Continued use of the damaged circuit board may cause overheating and fire.

Chapter 2 Restrictions

2-1	System Configurations	19
2-2	Types and Maximum Allowable Length of Cables	20
2-3	Switch Settings	21
2-4	M-NET Address Settings	22
2-4-1	Address Settings List	22
2-4-2	Outdoor Unit Power Jumper Connector Connection	24
2-4-3	Outdoor Unit Centralized Controller Switch Setting	24
2-4-4	Room Temperature Detection Position Selection	24
2-4-5	Start/Stop Control of Indoor Units	25
2-4-6	Miscellaneous Settings	25
2-4-7	Various Control Methods Using the Signal Input/Output Connector on Outdoor Unit	26
2-5	Demand Control Overview	29
2-6	System Connection Example	30
2-7	Example System with an MA Remote Controller	32
2-7-1	Single Refrigerant System (Automatic Indoor/Outdoor Address Startup)	32
2-7-2	Single Refrigerant System with Two or More LOSSNAY Units	34
2-7-3	Grouped Operation of Units in Separate Refrigerant Circuits	36
2-7-4	System with a Connection of System Controller to Centralized Control Transmission Line	38
2-7-5	System with a Connection of System Controller to Indoor-Outdoor Transmission Line	40
2-7-6	System with Multiple BC Controllers	42
2-8	Example System with an ME Remote Controller	46
2-8-1	System with a Connection of System Controller to Centralized Control Transmission Line	46
2-9	Example System with an MA and an ME Remote Controller	48
2-9-1	System with a Connection of System Controller to Centralized Control Transmission Line	48
2-10	Restrictions on Refrigerant Pipes	51
2-10-1	Restrictions on Refrigerant Pipe Length	51
2-10-2		
2-10-3	BC Controller Connection Method	58

2-1 System Configurations

1. Table of compatible indoor units

The table below summarizes the types of indoor units that are compatible with different types of outdoor units.

Outdoor units	Compos	ing units	Maximum total capacity of connectable indoor units	Maximum number of connectable indoor units	Types of connectable indoor units
72	-	-	36 - 108	18	P06 - P96 models
96	-	-	48 - 144	24	R410A series indoor units
144	72	72	72 - 216	36	
192	96	96	96 - 288	48	

Note

- 1) "Maximum total capacity of connectable indoor units" refers to the sum of the numeric values in the indoor unit model names.
- 2) If the total capacity of the indoor units that are connected to a given outdoor unit exceeds the capacity of the outdoor unit, the indoor units will not be able to perform at the rated capacity when they are operated simultaneously. Select a combination of units so that the total capacity of the connected indoor units is at or below the capacity of the outdoor unit whenever possible.

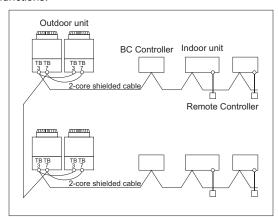
2-2 Types and Maximum Allowable Length of Cables

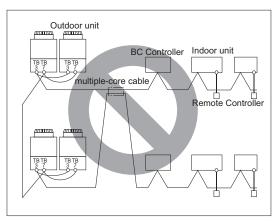
1. Wiring work

(1) Notes

- 1) Have all electrical work performed by an authorized electrician according to the local regulations and instructions in this man-
- 2) Install external transmission cables at least 5cm [1-31/32"] away from the power supply cable to avoid noise interference. (Do not put the control cable and power supply cable in the same conduit tube.)
- 3) Provide grounding for the outdoor unit as required.
- 4) Run the cable from the electric box of the indoor or outdoor unit in such way that the box is accessible for servicing.
- 5) Do not connect power supply wiring to the terminal block for transmission line. Doing so will damage the electronic components on the terminal block.
- 6) Use 2-core shielded cables as transmission cables.

Use a separate 2-core control cable for each refrigerant system. Do not use a single multiple-core cable to connect indoor units that belong to different refrigerant systems. The use of a multiple-core cable may result in signal transmission errors and malfunctions.





TB3: Terminal block for indoor-outdoor transmission line TB7: Terminal block for centralized control 7) When extending the transmission cable, be sure to extend the shield wire.

(2) Control wiring

Different types of control wiring are used for different systems. Before performing wiring work, refer to the following page(s).

- [2-7 Example System with an MA Remote Controller](page 32)
- [2-8 Example System with an ME Remote Controller](page 46)
- [2-9 Example System with an MA and an ME Remote Controller](page 48)

Types and maximum allowable length of cables

Control lines are categorized into 2 types: transmission line and remote controller line.

Use the appropriate type of cables and observe the maximum allowable length specified for a given system. If a given system has a long transmission line or if a noise source is located near the unit, place the unit away from the noise source to reduce noise interference.

1) M-NET transmission line

Facility type	All facility types				
Cable tune	Туре	Shielded cable CVVS, CPEVS, MVVS			
Cable type Number cores	Number of cores	2-core cable			
Cable size		Larger than 1.25mm ² [AWG16]			
Maximum transmission line distance between the outdoor unit and the farthest indoor unit		200 m [656ft] max.			
Maximum tra line distance ized control a outdoor trans (Maximum lii via outdoor u	for central- and Indoor/ smission line ne distance	500 m [1640ft] max. *The maximum overall line length from the power supply unit on the transmission lines for centralized control to each outdoor unit or to the system controller is 200m [656ft] max.			

2) Remote controller wiring

		MA remote controller*1	ME remote controller*5
	Туре	CVV	CVV
Cable type	Number of cores	2-core cable	2-core cable
Cable type	Cable size	0.3 to 1.25mm ² * ² * ⁴ [AWG22 to 16] (0.75 to 1.25mm ²) * ³ [AWG18 to 16]	0.3 to 1.25mm ² * ² [AWG22 to 16] (0.75 to 1.25mm ²) * ³ [AWG18 to 16]
Maximum over length	erall line	200 m [656ft] max.	The section of the cable that exceeds 10m [32ft] must be included in the maximum indoor-outdoor transmission line distance.

- *1 MA remote controller refers to MA remote controller (PAR-20MAU, PAR-21MAAU, PAR-30MAAU), Simple MA Remote Controller, and wireless remote controller.
- *2 The use of cables that are smaller than 0.75mm² (AWG18) is recommended for easy handling.
- *3 When connected to the terminal block on the Simple remote controller, use cables that meet the cable size specifications shown in the parenthesis.
- *4 When connecting PAR-30MAAU, use a 0.3mm² sheathed cable.
- *5 ME remote controller refers to ME remote controller and Simple ME Remote Controller.

2-3 Switch Settings

1. Switch setting

The necessary switch settings depend on system configuration. Before performing wiring work, refer to the following page(s). [2-7 Example System with an MA Remote Controller](page 32)

[2-8 Example System with an ME Remote Controller](page 46)

[2-9 Example System with an MA and an ME Remote Controller](page 48)

If the switch settings are changed while the unit is being powered, those changes will not take effect, and the unit will not function properly.

Units on which to set the switches		Symbol	Units to which the power must be shut off
CITY MULTI indoor unit	Main/sub unit	IC	Outdoor units *3 and Indoor units
LOSSNAY, OA processing unit *1		LC	Outdoor units *3 and LOSSNAY
ME remote controller	Main/sub remote controller	RC	Outdoor units *3
MA remote controller *4	Main/sub remote controller	MA	Indoor units
CITY MULTI outdoor unit*2		OC,OS	Outdoor units *3
BC controller	Main	BC	Outdoor units *3 and BC controller
	Sub1, 2	BS1, BS2	Outdoor units *3 *5 and BC controller

- *1. Applicable when LOSSNAY units are connected to the indoor-outdoor transmission line.
- *2. The outdoor units in the same refrigerant circuit are automatically designated as OC and OS in the order of capacity from large to small (if two or more units have the same capacity, in the order of address from small to large).
- *3. Turn off the power to all the outdoor units in the same refrigerant circuit.
- *4. When a PAR-30MAAU is connected to a group, no other MA remote controllers can be connected to the same group.
- *5. When setting the switch SW4 of the control board, set it with the outdoor unit power on. Refer to the following page(s). [5-1-1 Outdoor Unit Switch Functions and Factory Settings](page 117)

M-NET Address Settings 2-4

2-4-1 **Address Settings List**

1. M-NET Address settings

(1) Address settings table

The need for address settings and the range of address setting depend on the configuration of the system.

Uni	t or controller	Sym- bol	Address setting range	Setting method	Factory address setting
CITYMULTI indoor unit	Main/sub unit	IC	50*1 *4 *6	Assign the smallest address to the main indoor unit in the group, and assign sequential address numbers to the rest of the indoor units in the same group.	
M-NET adapter				In an R2 system with a sub BC controller, make the settings for the indoor units in the following order.	
M-NET con- trol interface				(i) Indoor unit to be connected to the main BC controller (ii) Indoor unit to be connected to sub BC controller 1 (iii) Indoor unit to be connected to sub BC controller 2	
Free Plan adapter				Make the settings for the indoor units in the way that the formula "(i) < (ii) < (iii)" is true.	
LOSSNAY, C	OA processing unit	LC	0, 01 to 50*1 *4 *6	Assign an arbitrary but unique address to each of these units after assigning an address to all indoor units.	00
ME remote controller	Main remote controller	RC	101 to 150	Add 100 to the smallest address of all the indoor units in the same group.	101
	Sub remote controller	RC	151 to 200 ^{*3}	Add 150 to the smallest address of all the indoor units in the same group.	
MA remote co	ontroller	MA	No address settings required. (The main/sub setting must be made if 2 remote controllers are connected to the system.) *7		Main
CITY MULTI	outdoor unit	OC OS	0, 51 to 100*1 *2 *6	Assign an address that equals the lowest address of the indoor units in the same refrigerant circuit plus 50. Assign sequential addresses to the outdoor units in the same refrigerant circuit. The outdoor units in the same refrigerant circuit are automatically designated as OC and OS.	00
Auxiliary outdoor unit	BC controller (main)	BC	0, 51 to 100*1 *2 *6	 Assign an address that equals the address of the outdoor unit in the same refrigerant system plus 1. If a given address overlaps any of the addresses that are assigned to the outdoor units or to the sub BC controller, use a different, unused address within the setting range. 	00
	BC controller (sub1, 2)	BS1 BS2	51 to 100 *2	 Assign an address to both the sub BC controller 1 and 2 that equals the lowest address of the indoor units that are connected to each of them plus 50. If a sub BC controller is connected, the automatic startup function is not available. 	

^{*1.} If a given address overlaps any of the addresses that are assigned to other units, use a different, unused address within the setting range.

^{*2.} To set the outdoor unit address or the auxiliary outdoor unit address to "100," set the rotary switches to "50."

*3. To set the ME remote controller address to "200," set the rotary switches to "00."

*4. Some models of indoor units have two or three control boards.

Assign an address to the No.1, No. 2, and No. 3 control boards so that the No. 2 control board address equals the No. 1 control board address plus 1, and that the No. 3 control board address equals the No. 1 control board address plus 2.

*5. The outdoor units in the same refrigerant circuit are automatically designated as OC, and OS. They are designated as OC, and OS in the descending order of adaptity (ascending order of adaptity (ascending order of adaptity).

the descending order of capacity (ascending order of address if the capacities are the same).

*6. No address settings are required for units in a system with a single outdoor unit (with some exceptions).

Address setting is required if a sub BC controller is connected.

*7. When a PAR-30MAAU is connected to a group, no other MA remote controllers can be connected to the same group.

Unit or controller		Sym- bol	Address setting range	Setting method	Factory address setting
System controller	Group remote controller	GR SC	201 to 250	Assign an address that equals the sum of the smallest group number of the group to be controlled and 200.	201
	System remote controller	SR SC		Assign an arbitrary but unique address within the range listed on the left to each unit.	
	ON/OFF remote controller	AN SC		Assign an address that equals the sum of the smallest group number of the group to be controlled and 200.	
	Schedule timer (compatible with M-NET)	ST SC		Assign an arbitrary but unique address within the range listed on the left to each unit.	202
	Central controller AG-150A G(B)-50A GB-24A	TR SC	000 201 to 250	Assign an arbitrary but unique address within the range listed on the left to each unit. The address must be set to "000" to control the K-control unit.	000
	Expansion controller PAC-YG50ECA	TR	000 201 to 250	Assign an arbitrary but unique address within the range listed on the left to each unit. The address must be set to "000" to control the K-control unit.	000
	BM adapter BAC-HD150	SC	000 201 to 250	Assign an arbitrary but unique address within the range listed on the left to each unit. The address must be set to "000" to control the K-control unit.	000
	LM adapter LMAP03U	SC	201 to 250	Assign an arbitrary but unique address within the range listed on the left to each unit.	247

2-4-2 Outdoor Unit Power Jumper Connector Connection

There are limitations on the total number of units that are connectable to each refrigerant system. Refer to the DATABOOK for details

System configuration	Connection to the system controller	Power supply unit for transmission lines	Group operation of units in a system with multiple outdoor units	Power supply switch connector connection		
System with one outdoor unit	_	-	-	Leave CN41 as it is (Factory setting)		
System with multiple outdoor units	Not connected	-	Not grouped			
			Grouped	Disconnect the male connector from the fe-		
	With connection to the indoor unit system	Not required	Grouped/not grouped	male power supply switch connector (CN41) and connect it to the female power supply switch connector (CN40) on only one of the outdoor units. ²		
	With connection to the central- ized control sys- tem	Not required*1 (Powered from the outdoor unit)	Grouped/not grouped	*Connect the S (shielded) terminal on the terminal block (TB7) on the outdoor unit whose CN41 was replaced with CN40 to the ground terminal (/h) on the electric box.		
		Required *1	Grouped/not grouped	Leave CN41 as it is (Factory setting)		

^{*1} The need for a power supply unit for transmission lines depends on the system configuration.

2-4-3 Outdoor Unit Centralized Controller Switch Setting

System configuration	Centralized control switch (SW5-1) settings *1		
Connection to the system controller Not connected	Leave it to OFF. (Factory setting)		
Connection to the system controller Connected *2	ON		

^{*1} Set SW5-1 on all outdoor units in the same refrigerant circuit to the same setting.

2-4-4 Room Temperature Detection Position Selection

To stop the fan during heating Thermo-OFF (SW1-7 and 1-8 on the indoor units to be set to ON), use the built-in thermistor on the remote controller or an optional thermistor.

- To use the built-in sensor on the remote controller, set the SW1-1 to ON. (Factory setting: SW1-1 set to "OFF".)
 - •Some models of remote controllers are not equipped with a built-in temperature sensor. Use the built-in temperature sensor on the indoor unit instead.
 - •When using the built-in sensor on the remote controller, install the remote controller where room temperature can be detected. (Note) Factory setting for SW1-1 on the indoor unit of the All-Fresh Models is ON.
- 2) When an optional temperature sensor is used, set SW1-1 to OFF, and set SW3-8 to ON.
 - •When using an optional temperature sensor, install it where room temperature can be detected.

^{*2} The replacement of the power jumper connector from CN41 to CN40 must be performed on only one outdoor unit in the system.

^{*2} When only the LM adapter is connected, leave SW5-1 to OFF (as it is).

2-4-5 Start/Stop Control of Indoor Units

Each indoor unit (or group of indoor units) can be controlled individually by setting SW 1-9 and 1-10.

Function	Operation of the indoor unit when the operation is resumed after the unit was stopped		Setting (SW1)*4 *5	
1 dilotion			10	
Power ON/OFF by the plug*1,*2,*3	Indoor unit will go into operation regardless of its operation status before power off (power failure). (In approx. 5 minutes)	OFF	ON	
Automatic restoration after power failure	Indoor unit will go into operation if it was in operation when the power was turned off (or cut off due to power failure). (In approx. 5 minutes)	ON	OFF	
	Indoor unit will remain stopped regardless of its operation status before power off (power failure).	OFF	OFF	

^{*1.} Do not cut off power to the outdoor unit. Cutting off the power supply to the outdoor unit will cut off the power supply to the belt heater and may cause the compressor to malfunction when the unit is put back into operation.

2-4-6 **Miscellaneous Settings**

Cooling-only setting for the indoor unit: Cooling only model (Factory setting: SW3-1 "OFF.") When using indoor unit as a cooling-only unit, set SW3-1 to ON.

belt heater and may cause the compressor to malfunction when the unit is put back into operation.

*2. Not applicable to units with a built-in drain pump or humidifier.

*3. Models with a built-in drain pump cannot be turned on/off by the plug individually. All the units in the same refrigerant circuits will be turned on or off by the plug.

*4. Requires that the dipswitch settings for all the units in the group be made.

*5. To control the external input to and output from the air conditioners with the PLC software for general equipment via the G(B)-50A, set SW1-9 and SW1-10 to ON. With these settings made, the power start-stop function becomes disabled. To use the auto recovery function after power failure while these settings are made, set SW1-5 to ON.

2-4-7 Various Control Methods Using the Signal Input/Output Connector on Outdoor Unit

(1) Various connection options

Туре	Usage	Function	Terminal to be used*1	Option
Input	Prohibiting cooling/heating operation (thermo OFF) by an external input to the outdoor unit. *It can be used as the DEMAND control device for each system.	DEMAND (level)	CN3D*2	Adapter for external input (PAC-
	Performs a low level noise operation of the outdoor unit by an external input to the outdoor unit. * It can be used as the silent operation device for each refrigerant system.	Low-noise mode (level) *3*4		SC36NA-E)
	Forces the outdoor unit to perform a fan operation by receiving signals from the snow sensor.*5*7	Snow sensor signal input (level)	CN3S	
	Cooling/heating operation can be changed by an external input to the outdoor unit.	Auto-changeover	CN3N	
	The operation mode of the unit can be changed from normal cooling operation (performance priority) to energy-saving cooling mode by an external signal input.	Energy-saving mode	CN3K	
Out- put	How to extract signals from the outdoor unit *It can be used as an operation status display device.	Operation status of the compressor*5	CN51	Adapter for external out-
	*It can be used for an interlock operation with external devices.	Error status*6 *8		put (PAC- SC37SA-E)

^{*1} For details, refer to section (2) Example of wiring connection.

When SW6-7 is set to ON: The low-noise mode always remains effective.

When SW6-7 is set to OFF: The low noise mode is cancelled when certain outside temperature or pressure criteria are met, and the unit goes into normal operation (capacity priority mode).

Low-noise mod is effective.		Capacity priority mode becomes effective.		
Cooling	Heating	Cooling Heating		
TH7<30°C[86°F] and 63HS1<32kg/cm ²	TH7>3°C[37°F] and 63LS>4.6kg/cm ²		TH7<0°C[32°F] or 63LS<3.9kg/cm ²	

^{*5} If multiple outdoor units are connected to the same refrigerant circuit, signal input/output settings need to be made for each outdoor unit.

^{*2} For details, refer to section (2) Example of wiring connection and other relevant sections in the manual. [2-5 Demand Control Overview](page 29)

^{*3} Low-noise mode is valid when Dip SW6-8 on the outdoor unit is set to OFF. When DIP SW6-8 is set to ON, 4 levels of on-DEMAND are possible, using different configurations of low-noise mode input and DEMAND input settings. When 2 or more outdoor units exist in one refrigerant circuit system, 8 levels of on-DEMAND are possible.

^{*4.} By setting Dip SW6-7, the Low-noise mode can be switched between the Capacity priority mode and the Low-noise priority mode.

^{*6} Take out signals from the outdoor unit that is designated as OC if multiple outdoor units in the same system.

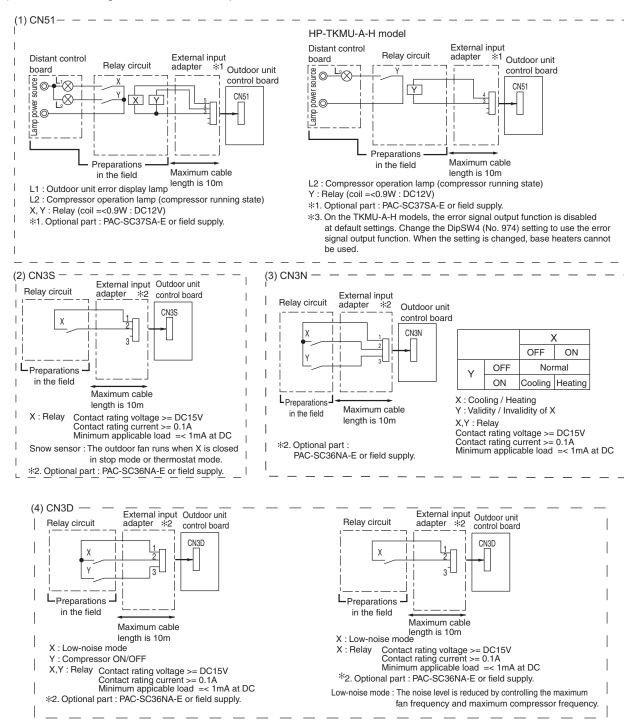
^{*7} If the formula TH7>5 holds true, the fan will not go into operation when the contact receives signal input.

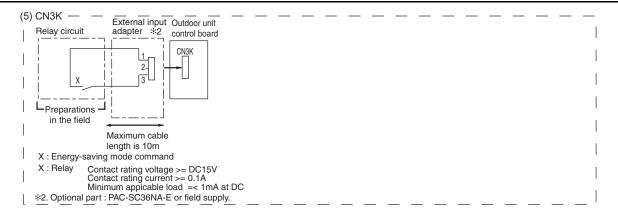
^{*8} On the TKMU-A-H models, the error signal output function is disabled at default settings. Change the DipSW4 (No. 974) setting to use the error signal output function. When the setting is changed, base heaters cannot be used.

(2) Example of wiring connection

⚠ CAUTION

- Wiring should be covered by insulation tube with supplementary insulation.
- 2) Use relays or switches with IEC or equivalent standard.
- 3) The electric strength between accessible parts and control circuit should have 2750V or more.





Demand Control Overview 2-5

(1) General outline of control

Demand control is performed by using the external signal input to the 1-2 and 1-3 pins of CN3D on the outdoor units (OC and OS). Between 2 and 8 steps of demand control is possible by setting Dip SW6-8 on the outdoor units (OC and OS).

No	Demand control switch	Dip S	W6-8	Input to CN3D*2
140	Demand Control Switch	ОС	OS	input to CNOD
1	2 steps (0-100%)	OFF	OFF	OC
2	4 steps (0-50-75-100%)	ON	OFF	OC
3	4 steps (0-30-73-10070)	OFF	ON	OS
4	8 steps (0-25-38-50-63-75-88-100%)	ON	ON	OC and OS

*1 Available demand functions

HP72 - HP96T(Y)KMU-A(-H) models (single-outdoor-unit system): 2 and 4 steps shown in the rows 1 and 2 in the table above

HP144 - HP192T(Y)KMU-A(-H) models (two-outdoor-unit system OC+OS): 2-8 steps shown in the rows 1, 2, 3, and 4 in the table above only.

*2 Signal is input to CN3D on the outdoor unit whose SW6-8 is set to ON. When SW6-8 is set to OFF on all outdoor units, the signal is input to the CN3D on the OC.

Outdoor units whose SW6-8 is set to ON are selectable in a single refrigerant system.

*3 If wrong sequence of steps are taken, the units may go into the Thermo-OFF (compressor stop) mode.

Ex) When switching from 100% to 50%

(Incorrect) 100% \rightarrow 0% \rightarrow 50% The units may go into the Thermo-OFF mode. (Correct) 100% \rightarrow 75% \rightarrow 50%

*4 The percentage of the demand listed in the table above is an approximate value based on the compressor volume and does not necessarily correspond with the actual capacity.

*5 Notes on using demand control in combination with the low-noise mode

To enable the low-noise mode, it is necessary to short-circuit 1-2 pin of CN3D on the outdoor unit whose SW6-8 is set to OFF. When SW6-8 is set to ON on all outdoor units, the following operations cannot be performed.

- •Performing 4-step demand in combination with the low-noise operation in a single-outdoor-unit system.
- *Performing 8-step demand in combination with the low-noise operation in a two-outdoor-unit system.

1) Contact input and control content

2-step demand control

The same control as the Thermo-OFF is performed by closing 1-3 pin of CN3D.

CN3D	
1-3	
Open	100%
Close	0%

4-step demand control (When SW6-8 is set to ON on an outdoor unit)

Demand capacity is shown below.

CN3D	1-2P		
1-3P	Open	Close	
Open	100%	75%	
Close	0%	50%	

8-step demand control (When SW6-8 is set to ON on two outdoor units)

Demand capacity is shown below.

8-step demand			No.2 CN3D					
		1-2P	(Open		Close		
No.1 CN3D	1-2P	1-3P	Open	Close	Open	Close		
	Open	Open	100%	50%	88%	75%		
		Close	50%	0%	38%	25%		
	Close	Open	88%	38%	75%	63%		
		Close	75%	25%	63%	50%		

^{*1.} The outdoor units whose SW6-8 is set to ON are designated as No. 1 and No. 2 in the order of address from small to large. Ex) When outdoor units whose SW6-8 is set to ON are designated as OC and OS, OC=No. 1 and OS=No. 2.

2-6 System Connection Example

Examples of typical system connection are shown below. Refer to the Installation Manual that came with each device or controller for details.

(1) An example of a system to which an MA remote controller is connected

	System configuration	Connection to the system controller	Address start up for in- door and outdoor units	Notes
1	System with one out- door unit	NO	Automatic address setup	
2	System with one out- door unit	NO	Manual address setup	Connection of multiple LOSS- NAY units
3	Grouping of units in a system with multiple outdoor units	NO	Manual address setup	
4	System with one out- door unit	With connection to transmission line for centralized control	Manual address setup	
5	System with one out- door unit	With connection to indoor-outdoor transmission line	Manual address setup	
6	System with one out- door unit	With connection to transmission line for centralized control	Manual address setup	Connection of multiple LOSS- NAY units

(2) An example of a system to which an ME remote controller is connected

	System configuration	Connection to the system controller	Address start up for indoor and outdoor units	Notes
1	System with one out- door unit	With connection to transmission line for centralized control	Manual address setup	

(3) An example of a system to which both MA remote controller and ME remote controller are connected

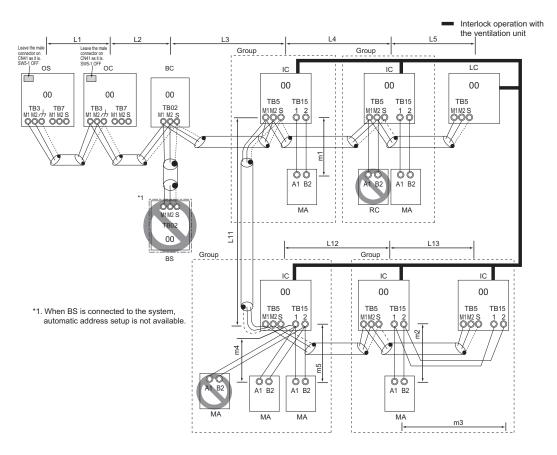
	System configuration	Connection to the system controller	Address start up for in- door and outdoor units	Notes
1	System with one out- door unit	With connection to transmission line for centralized control	Manual address setup	

^{*}MA remote controller and ME remote controller cannot both be connected to the same group.

Example System with an MA Remote Controller

2-7-1 Single Refrigerant System (Automatic Indoor/Outdoor Address Startup)

(1) Sample control wiring



(2) Cautions

- 1) ME remote controller and MA remote controller cannot both be connected to the same group of indoor units.
- No more than 2 MA remote controllers can be connected to a group of indoor units. It is not possible to connect a pair of PAR-30MAAU.
- 3) When the number of the connected indoor units is as shown in the table below, one or more transmission boosters (sold separately) are required.

To connect two transmission boosters, connect them in parallel. (Observe the maximum number of connectable indoor units that are listed in the specifications for each outdoor

	Number of transmission booster (sold separately) required	
	1 unit	2 units
When the P72 and P96 models are not included in the connected indoor units	27 - 50 units	-
When the P72 and P96 models are included in the connected indoor units	21 - 39 units	40 - 50 units

•The table above shows the number of transmission boosters that is required by the system with three BC controllers. For each BC controller that is subtracted from the abovementioned system, two additional indoor units can be connected.

- 4) Automatic address setup is not available if start-stop input (CN32, CN51, CN41) is used for a group operation of indoor units or when multiple indoor units with different functions are grouped in the same group. Refer to the following page(s). [2-7-2 Single Refrigerant System with Two or More LOSSNAY Units](page 34)
- 5) For information about connecting two or more LOSSNAY units to a system, refer to the following page(s). [2-7-2 Single Refrigerant System with Two or More LOSSNAY Units](page 34)

(3) Maximum allowable length

1) Indoor/outdoor transmission line

Maximum distance (1.25mm² [AWG16] or larger) L1 +L2+L3+L4+L5≤200m[656ft] L1 +L2+L3+L11+L12+L13≤200m[656ft]

Transmission line for centralized control

No connection is required.

MA remote controller wiring

Maximum overall line length (0.3 to 1.25mm² [AWG22 to 16]) m1≤200m [656ft] m2+m3≤200m [656ft] m4+m5≤200m [656ft]

*When connected to the terminal block on the Simple remote controller, use cables that meet the following cable size specifications: 0.75 - 1.25 mm² [AWG18-14]. *When connecting PAR-30MAAU, use a 0.3 mm sheathed cable.

1) Indoor/outdoor transmission line

Daisy-chain terminals M1 and M2 of the terminal block for indoor-outdoor transmission line (TB3) on the outdoor units (OC and OS), of the terminal block for indoor-outdoor transmission line (TB02) on the main BC controller (BC), and of the terminal block for indoor-outdoor transmission line (TB5) on each indoor unit (IC). (Non-polarized two-wire)

Only use shielded cables.

Note |

The outdoor units in the same refrigerant circuit are automatically designated as OC and OS in the order of capacity from large to small (if two or more units have the same capacity, in the order of address from small to large).

Shielded cable connection

Daisy-chain the ground terminal ($//_{\!\! H}$) on the outdoor units (OC and OS), the S terminal of the terminal block (TB02) on the BC controller (BC), and the S terminal of the terminal block (TB5) on the indoor unit (IC) with the shield of the shielded cable.

2) Transmission line for centralized control

No connection is required.

3) MA remote controller wiring

Connect terminals 1 and 2 on the terminal block for MA remote controller line (TB15) on the indoor unit (IC) to the terminal block on the MA remote controller (MA). (Non-polarized two-wire)

When 2 remote controllers are connected to the system

When 2 remote controllers are connected to the system, connect terminals 1 and 2 of the terminal block (TB15) on the indoor unit (IC) to the terminal block on the two MA

remote controllers.

•Set one of the MA remote controllers as a sub controller. (Refer to the Instruction Manual for the MA remote controller for the setting method.)

Group operation of indoor units

To perform a group operation of indoor units (IC), daisychain terminals 1 and 2 on the terminal block (TB15) on all indoor units (IC) in the same group, and then connect terminals 1 and 2 on the terminal block (TB15) on the indoor unit on one end to the terminal block on the MA remotecontroller. (Non-polarized two-wire)

•When performing a group operation of indoor units that have different functions, "Automatic indoor/outdoor addresssetup" is not available.

4) LOSSNAY connection

Connect terminals M1 and M2 on the terminal block(TB5) on the indoor unit (IC) to the appropriate terminals on the terminal block (TB5) on LOSSNAY (LC). (Non-polarized two-wire)

- •Interlock operation setting with all the indoor units in the same system will automatically be made. (It is required that the Lossnay unit be turned on before the outdoorunit.)
- •For information about certain types of systems (1. Systems in which the LOSSNAY unit is interlocked with only part of the indoor units, 2. Systems in which the LOSSNAY unit is operated independently from the indoor units, 3. Systems in which more than 16 indoor units are interlocked with the LOSSNAY unit, and 4. Systems to which two ore more LOSSNAY units are connected), refer to the following page(s). [2-7-2 Single Refrigerant System with Two or More LOSSNAY Units](page 34)
- Switch setting

Address setting is required as follows.

(5) Address setting method

Proce- dures	Unit	or controller		Address set- ting range	Setting method	Notes	Factory setting
1	Indoor unit	Main unit	IC	No settings	-	Port number setting is required	00
		Sub unit	IC	required.		For information about how to perform a group operation of indoor units that feature different functions, refer to the following page(s). [2-7-2 Single Refrigerant System with Two or More LOSS-NAY Units](page 34)	
2	LOSSNAY		LC	No settings required.	-		00
3	MA remote con- troller	Main remote controller	MA	No settings required.	-	It is not possible to connect a pair of PAR-30MAAU.	Main
		Sub remote con- troller	MA	Sub remote con- troller	Settings to be made with the Sub/Main switch		
4	Outdoor unit		OC OS	No settings required.	-		00
5	Auxiliary outdoor unit	BC controller	ВС	No settings required.	-		00

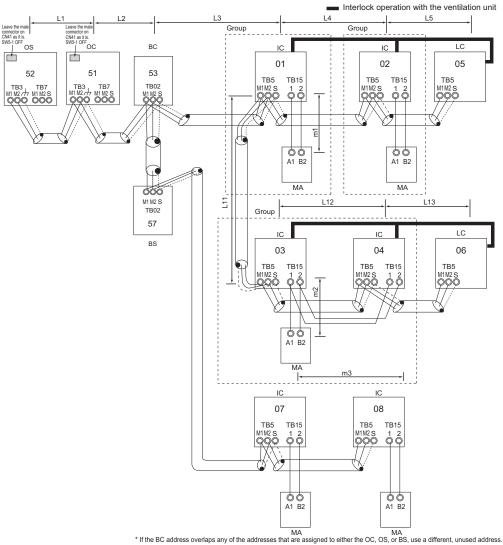
Note |

The outdoor units in the same refrigerant circuit are automatically designated as OC and OS.

They are designated as OC and OS in the descending order of capacity (ascending order of address if the capacities are the same).

2-7-2 Single Refrigerant System with Two or More LOSSNAY Units

(1) Sample control wiring



OC, OS, and BS addresses (lowest indoor unit address in the group plus +50) have higher priority than the BS address

(2) Cautions

- 1) ME remote controller and MA remote controller cannot both be connected to the same group of indoor units.
- No more than 2 MA remote controllers can be connected to a group of indoor units. It is not possible to connect a pair of PAR-30MAAU.
- When the number of the connected indoor units is as shown in the table below, one or more transmission boosters (sold separately) are required.
 - To connect two transmission boosters, connect them in parallel. (Observe the maximum number of connectable indoor units that are listed in the specifications for each outdoor unit.)

	Number of transmission booster (sold separately) required		
	1 unit	2 units	
When the P72 and P96 models are not included in the connected indoor units	27 - 50 units	-	
When the P72 and P96 models are included in the connected indoor units	21 - 39 units	40 - 50 units	

- •The table above shows the number of transmission boosters that is required by the system with three BC controllers. For each BC controller that is subtracted from the abovementioned system, two additional indoor units can be con-
- •Refer to the DATABOOK for further information about how many booster units are required for a given system.

(3) Maximum allowable length

- Indoor/outdoor transmission line
 - Same as 2-7-1
- Transmission line for centralized control No connection is required.
- MA remote controller wiring Same as 2-7-1

1) Indoor/outdoor transmission line

Daisy-chain terminals M1 and M2 of the terminal block for indoor-outdoor transmission line (TB3) on the outdoor units (OC and OS), of the terminal block for indoor-outdoor transmission line (TB02) on the main and sub BC controllers (BC and BS), and of the terminal block for indoor-outdoor transmission line (TB5) on each indoor unit (IC). (Non-polarized two-wire)

Only use shielded cables.

Note

The outdoor units in the same refrigerant circuit are automatically designated as OC and OS in the order of capacity from large to small (if two or more units have the same capacity, in the order of address from small to large).

Shielded cable connection

2) Transmission line for centralized control

(5) Address setting method

No connection is required.

3) MA remote controller wiring

Same as 2-7-1

When 2 remote controllers are connected to the system

Same as 2-7-1

Group operation of indoor units

Same as 2-7-1

4) LOSSNAY connection

Connect terminals M1 and M2 on the terminal block (TB5) on the indoor unit (IC) to the appropriate terminals on the terminal block (TB5) on LOSSNAY (LC). (Non-polarized two-wire)

•Interlock setting between the indoor units and LOSS-NAY units must be entered on the remote controller. For information about how to interlock the operation of indoor and LOSSNAY units, refer to the following page(s) in this Service Handbook.

[6-5 Making Interlock Settings from an MA Remote Controller](page 157)

5) Switch setting

Address setting is required as follows.

Proce- dures	Unit	or controller		Address setting range	Setting method	Notes	Fac- tory set- ting
1	Indoor Main unit unit		IC	01 to 50	Assign the smallest address to the main unit in the group. In a system with a sub BC controller, make the settings for the indoor units in the following order. (i) Indoor unit to be connected to the main BC controller (ii) Indoor unit to be connected to sub BC controller 1 (iii) Indoor unit to be connected to sub BC controller 2 Make the settings for the indoor units in the way that the formula "(i) < (ii) < (iii)"	Port number setting is required To perform a group operation of indoor units that feature different functions, designate the indoor unit in the group with the greatest number of functions as the main unit.	00
		Sub unit			Assign sequential numbers starting with the address of the main unit in the same group +1. (Main unit address +1, main unit address +2, main unit address +3, etc.)		
2	LOSSNAY		LC	01 to 50	Assign an arbitrary but unique address to each of these units after assigning an address to all indoor units.	None of these addresses may overlap any of the indoor unit addresses.	00
3	MA remote controller	Main remote controller	MA	No set- tings re- quired.	-	It is not possible to connect a pair of PAR-30MAAU.	Main
		Sub remote controller	MA	Sub remote controller	Settings to be made with the Sub/ Main switch		
4	Outdoor unit		OC OS	51 to 100	Assign sequential address to the outdoor units in the same refrigerant circuit. The outdoor units are automatically designated as OC and OS.(Note)	To set the address to 100, set the rotary switches to 50. If the addresses that is assigned to the main BC controller overlaps any of the	00
5	Auxiliary outdoor unit	BCcon- troller (Sub)	BS	51 to 100	Assign an address that equals the sum of the smallest address of the indoor units that are connected to the sub BC controller and 50.	addresses that are assigned to the outdoor units or to the sub BC controller, use a dif- ferent, unused address with- in the setting range.	
		BC control- ler (Main)	ВС		OC (or OS if it exists) +1	The use of a sub BC control- ler requires the connection of a main BC controller.	

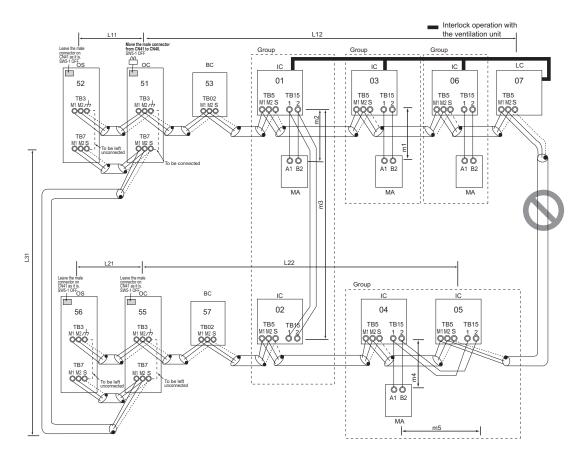
Note

The outdoor units in the same refrigerant circuit are automatically designated as OC and OS.

They are designated as OC and OS in the descending order of capacity (ascending order of address if the capacities are the same).

2-7-3 Grouped Operation of Units in Separate Refrigerant Circuits

(1) Sample control wiring



(2) Cautions

- 1) ME remote controller and MA remote controller cannot both be connected to the same group of indoor units.
- No more than 2 MA remote controllers can be connected to a group of indoor units. It is not possible to connect a pair of PAR-30MAAU.
- Do not connect the terminal blocks (TB5) on the indoor units that are connected to different outdoor units with each other.
- Replacement of male power jumper connector (CN41) must be performed only on one of the outdoor units.
- Provide grounding to S terminal on the terminal block for transmission line for centralized control (TB7) on only one of the outdoor units.
- 6) When the number of the connected indoor units is as shown in the table below, one or more transmission boosters (sold separately) are required.

To connect two transmission boosters, connect them in parallel. (Observe the maximum number of connectable indoor units that are listed in the specifications for each outdoor unit.)

	Number of transmission booster (sold separately) required			
	1 unit	2 units		
When the P72 and P96 models are not included in the connected indoor units	27 - 50 units	-		
When the P72 and P96 mod- els are included in the con- nected indoor units	21 - 39 units	40 - 50 units		

- •The left table shows the number of transmission boosters that is required by the system with three BC controllers. For each BC controller that is subtracted from the above-mentioned system, two additional indoor units can be connected.
- •Refer to the DATABOOK for further information about how many booster units are required for a given system.

(3) Maximum allowable length

- Indoor/outdoor transmission line
 Maximum distance (1.25mm² [AWG16] or larger)
 L11+L12≤200m [656ft]
 L21+L22≤200m [656ft]
- Transmission line for centralized control L31+L21≤200m [656ft]
- 3) MA remote controller wiring
 - Same as 2-7-1
- 4) Maximum line distance via outdoor unit (1.25mm² [AWG16] or larger)
 L12(L11)+L31+L22(L21)≤500m [1640ft]

1) Indoor/outdoor transmission line

Same as 2-7-2

Shielded cable connection

Same as 2-7-2

2) Transmission line for centralized control

Daisy-chain terminals M1 and M2 on the terminal block for transmission line for centralized control (TB7) on the outdoor units (OC) in different refrigerant circuits and on the OC and OS (Note a) in the same refrigerant circuit. If a power supply unit is not connected to the transmission line for centralized control, replace the power jumper connector on the control board from CN41 to CN40 on only one of the outdoor units.

Note

- a) The outdoor units in the same refrigerant circuit are automatically designated as OC and OS in the order of capacity from large to small (if two or more units have the same capacity, in the order of address from small to large).
- b) If TB7's on the outdoor units in the same refrigerant circuit are not daisy-chained, connect the transmission line for the central control system to TB7 of the OC. (Note a). To maintain the central control even during an OC failure or a power failure, connect TB7 on OC and OS together. (If there is a

problem with the outdoor unit whose power jumper was moved from CN41 to CN40, central control is not possible, even if TB7's are daisy-chained.)

- even if TB7's are daisy-chained.)
 c) When connecting TB7, only commence after checking that the voltage is below 20 VDC.
 - Only use shielded cables.

Shielded cable connection

Daisy-chain the S terminal on the terminal block (TB7) on the outdoor units (OC, OS) with the shield wire of the shielded cable. Short-circuit the earth terminal ($\frac{1}{11}$) and the S terminal on the terminal block (TB7) on the outdoor unit whose power jumper connector is mated with CN40.

3) MA remote controller wiring

Same as 2-7-1

When 2 remote controllers are connected to the system Same as 2-7-1

Group operation of indoor units

Same as 2-7-1

- 4) LOSSNAY connection
- Same as 2-7-2
- 5) Switch setting

Address setting is required as follows.

(5) Address setting method

Proce- dures	Unit	or controller		Address setting range	Setting method	Notes	Fac- tory set- ting
1	Indoor unit Main unit Sub unit		IC	01 to 50	Assign the smallest address to the main unit in the group. In a system with a sub BC controller, make the settings for the indoor units in the following order. Indoor unit to be connected to the main BC controller Indoor unit to be connected to sub BC controller 1 Indoor unit to be connected to sub BC controller 2 Make the settings for the indoor units in the way that the formula "(i) < (ii) < (iii)" is true.	Port number setting is required To perform a group operation of indoor units that feature different functions, designate the indoor unit in the group with the greatest number of functions as the main unit.	00
		Sub unit			the address of the main unit in the same group +1. (Main unit address +1, main unit address +2, main unit address +3, etc.)		
2	LOSSNAY		LC	01 to 50	Assign an arbitrary but unique address to each of these units after assigning an address to all indoor units.	None of these addresses may overlap any of the indoor unit addresses.	00
3	MA remote controller	Main remote controller	MA	No set- tings re- quired.	-	It is not possible to connect a pair of PAR-30MAAU.	Main
		Sub remote controller	MA	Sub remote controller	Settings to be made with the Sub/ Main switch		
4	Outdoor unit		OC OS	51 to 100	Assign sequential address to the outdoor units in the same refrigerant circuit. The outdoor units are automatically designated as OC and OS.(Note)	To set the address to 100, set the rotary switches to 50. If the addresses that is assigned to the main BC controller overlaps any of the	00
5	Auxiliary outdoor unit	BCcon- troller (Sub)	BS	51 to 100	Assign an address that equals the sum of the smallest address of the indoor units that are connected to the sub BC controller and 50.	addresses that are assigned to the outdoor units or to the sub BC controller, use a dif- ferent, unused address with- in the setting range.	
		BC control- ler (Main)	ВС		OC (or OS if it exists) +1	•The use of a sub BC control- ler requires the connection of a main BC controller.	

Note

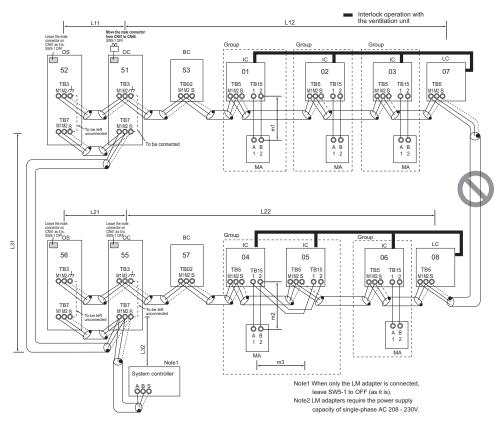
The outdoor units in the same refrigerant circuit are automatically designated as OC and OS.

They are designated as OC and OS in the descending order of capacity (ascending order of address if the capacities are the same).

2-7-4 System with a Connection of System Controller to Centralized Control Transmission Line

(1) Sample control wiring

An example of a system in which a system controller is connected to the transmission cable for the centralized control system and the power is supplied from the outdoor unit



(2) Cautions

- ME remote controller and MA remote controller cannot both be connected to the same group of indoor units.
- No more than 2 MA remote controllers can be connected to a group of indoor units. It is not possible to connect a pair of PAR-30MAAU.
- Do not connect the terminal blocks (TB5) on the indoor units that are connected to different outdoor units with each other.
- Replacement of male power jumper connector (CN41) must be performed only on one of the outdoor units.
- 5) When the System controller is connected TB7 side and TKMU outdoor unit model is used, connect a PAC-SC51KUA to TB7 side. If a PAC-SC51KUA cannot be used, connect the System controller to TB3 side. When YKMU outdoor unit model is used, the male power supply connector can be connected to CN40, and the System controller can be connected to TB7 side.
- Short-circuit the shield terminal (S terminal) and the earth terminal (1/1) on the terminal block for transmission line for centralized control (TB7) on the outdoor unit whose power jumper connector is mated with CN40.
- When the number of the connected indoor units is as shown in the table below, one or more transmission boosters (sold separately) are required.
 - To connect two transmission boosters, connect them in parallel. (Observe the maximum number of connectable indoor units that are listed in the specifications for each outdoor unit.)

	Number of transmission booster (sold separately) required			
	1 unit	2 units		
When the P72 and P96 models are not included in the connected indoor units	27 - 50 units	-		
When the P72 and P96 models are included in the connected indoor units	21 - 39 units	40 - 50 units		

- •The left table shows the number of transmission boosters that is required by the system with three BC controllers. For each BC controller that is subtracted from the above-mentioned system, two additional indoor units can be connected.
- •Refer to the DATABOOK for further information about how many booster units are required for a given system.
- 8) When a power supply unit is connected to the transmission line for centralized control, leave the power jumper connector on CN41 as it is (factory setting).

(3) Maximum allowable length

- Indoor/outdoor transmission line Same as 2-7-3
- Transmission line for centralized control L31+L32(L21) ≤200m [656ft]
- 3) MA remote controller wiring Same as 2-7-1
- 4) Maximum line distance via outdoor unit (1.25mm² [AWG16] or larger)
 L32+L31+L12(L11) ≤500m [1640ft]
 L32+L22(L21) ≤500m [1640ft]
 L12(L11)+L31+L22(L21) ≤500m[1640ft]

1) Indoor/outdoor transmission line

Same as 2-7-2

Only use shielded cables.

Shielded cable connection

Same as 2-7-2

Transmission line for centralized control

Daisy-chain terminals A and B on the system controller, terminals M1 and M2 on the terminal block for transmission line for centralized control (TB7) on the outdoor units (OC) in different refrigerant circuits and on the outdoor units (OC and OS) in the same refrigerant circuit. (Note b)

If a power supply unit is not connected to the transmission line for centralized control, replace the power jumper connector on the control board from CN41 to CN40 on only one of the outdoor units.

If a system controller is connected, set the central control switch (SW5-1) on the control board of all outdoor units to

Note

 The outdoor units in the same refrigerant circuit are automatically designated as OC and OS in the order of capacity from large to small (if two or more units have the same capacity, in the order of address from small to large).

b) If TB7's on the outdoor units in the same refrigerant circuit are not daisy-chained, connect the transmission line for the central control system to TB7 of the OC. (Note a). To maintain the central control even during an OC failure or a power failure, connect TB7 on OC and OS together. (If there is a problem with the outdoor unit whose power impossing.) problem with the outdoor unit whose power jumper was

moved from CN41 to CN40, central control is not possible,

even if TB7's are daisy-chained.)
c) When connecting TB7, only commence after checking that the voltage is below 20 VDC.

Only use shielded cables

Shielded cable connection

Daisy-chain the S terminal of the terminal block (TB7) on the system controller, OC, and OS with the shield of the shielded cable. Short-circuit the earth terminal ($\frac{1}{11}$) and the S terminal on the terminal block (TB7) on the outdoor unit whose power jumper connector is mated with CN40.

MA remote controller wiring

Same as 2-7-1

When 2 remote controllers are connected to the system Same as 2-7-1

Group operation of indoor units Same as 2-7-1

LOSSNAY connection

Connect terminals M1 and M2 on the terminal block (TB5) on the indoor unit (IC) to the appropriate terminals on the terminal block for indoor-outdoor transmission line (TB5) on LOSSNAY (LC). (Non-polarized two-wire)

Indoor units must be interlocked with the LOSSNAY unit using the system controller. (Refer to the operation manual for the system controller for the setting method.) Interlock setting from the remote controller is required if the ON/OFF remote controller alone or the LM adapter alone is connected.

Switch setting

Address setting is required as follows.

(5) Address setting method

Proce- dures	Unit or controller			Ad- dress setting range	Setting method	Notes	Fac- tory set- ting	
1	Indoor unit	Main unit	IC	01 to 50	Assign the smallest address to the main unit in the group. In a system with a sub BC controller, make the settings for the indoor units in the following order. (i) Indoor unit to be connected to the main BC controller (ii) Indoor unit to be connected to sub BC controller 1 (iii) Indoor unit to be connected to sub BC controller 2 Make the settings for the indoor units in the way that the formula "(i) < (ii) < (iii)" is true. Assign sequential numbers starting with the address of the main unit in the same group +1. (Main unit address +1, main unit address	Port number setting is required To perform a group operation of indoor units that feature different functions, designate the indoor unit in the group with the greatest number of functions as the main unit.	00	
					+2, main unit address +3, etc.)			
2	LOSSNAY		LC	01 to 50	Assign an arbitrary but unique address to each of these units after assigning an address to all indoor units.	None of these addresses may overlap any of the indoor unit addresses.	00	
3	MA remote controller	Main remote con- troller	MA	No set- tings re- quired.	-	Make the same indoor unit group settings with the system controller as the ones that were made with the MA remote controller. It is not possi-	Main	
		Sub remote con- troller	MA	Sub remote controller	Settings to be made with the Sub/ Main switch	ble to connect a pair of PAR- 30MAAU.		
4			OC OS	51 to 100	Assign sequential address to the outdoor units in the same refrigerant circuit. The outdoor units are automatically designated as OC and OS.(Note)	To set the address to 100, set the rotary switches to 50. If the addresses that is assigned to the main BC controller overlaps any of the addresses that are as-	00	
5	5 Auxiliary outdoor unit		BCcon- troller (Sub)		.,	Assign an address that equals the sum of the smallest address of the indoor units that are connected to the sub BC controller and 50.	signed to the outdoor units or to the sub BC controller, use a differ- ent, unused address within the setting range.	
		BC control- ler (Main)	ВС		OC (or OS if it exists) +1	The use of a sub BC controller requires the connection of a main BC controller.		

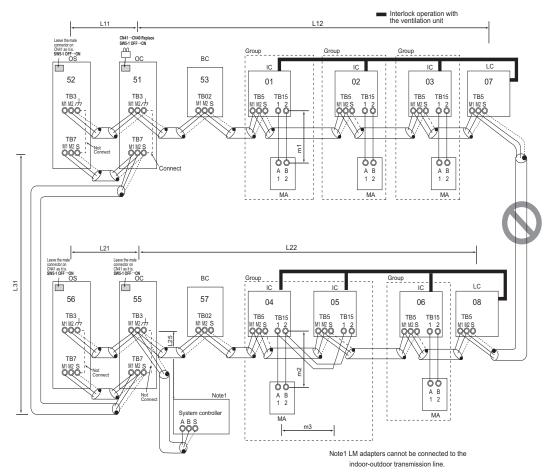
Note

The outdoor units in the same refrigerant circuit are automatically designated as OC and OS.

They are designated as OC and OS in the descending order of capacity (ascending order of address if the capacities are the same).

2-7-5 System with a Connection of System Controller to Indoor-Outdoor **Transmission Line**

(1) Sample control wiring



(2) Cautions

- ME remote controller and MA remote controller cannot both be connected to the same group of indoor units.
- No more than 2 MA remote controllers can be connected to a group of indoor units. It is not possible to connect a pair of PAR-30MAAU.
- Do not connect the terminal blocks (TB5) on the indoor units that are connected to different outdoor units with each other.
- Replacement of male power jumper connector (CN41) must be performed only on one of the outdoor units.
- Provide grounding to S terminal on the terminal block for transmission line for centralized control (TB7) on only one of the outdoor
- A maximum of 3 system controllers can be connected to the indooroutdoor transmission line, with the exception that only one G(B)-50A may be connected.
- When the total number of indoor units exceeds 20 (12 if one or more indoor units of the 72 model or above is connected), it may not be possible to connect a system controller to the indoor-outdoor transmission line
- When the number of the connected indoor units is as shown in the table below, one or more transmission boosters (sold separately) are required.
 - To connect two transmission boosters, connect them in parallel. (Observe the maximum number of connectable indoor units that are listed in the specifications for each outdoor unit.)

	Number of transmission booster (sold separately) required		
	1 unit	2 units	
When the P72 and P96 models are not included in the connected indoor units	27 - 50 units	-	
When the P72 and P96 models are included in the connected indoor units	21 - 39 units	40 - 50 units	

- •The table above shows the number of transmission boosters that is required by the system with three BC controllers. For each BC controller that is subtracted from the above-mentioned system, two additional indoor units can be connected.
- •Refer to the DATABOOK for further information about how many booster units are required for a given system.

(3) Maximum allowable length

Indoor/outdoor transmission line

Maximum distance (1.25mm² [AWG16] or larger) L11+L12≤200m [656ft] L21+L22≤200m [656ft] L25≤200m [656ft]

- 2) Transmission line for centralized control L31+L21≤200m [656ft]
- MA remote controller wiring

Same as 2-7-1 Maximum line distance via outdoor unit (1.25mm² [AWG16] or larger)

L25+L31+L12(L11)≤500m [1640ft] L12(L11)+L31+L22(L21)≤500m [1640ft]

1) Indoor/outdoor transmission line

Daisy-chain terminals M1 and M2 of the terminal block for indoor-outdoor transmission line (TB3) on the outdoor units (OC and OS) (Note a), of the terminal block for indoor-outdoor transmission line (TB02) on the main and sub BC controllers (BC and BS), of the terminal block for indoor-outdoor transmission line (TB5) on each indoor unit (IC), and the S terminal of the system controller.(Non-polarized two-wire)

Only use shielded cables.

Note

 The outdoor units in the same refrigerant circuit are automatically designated as OC and OS in the order of capacity from large to small (if two or more units have the same capacity, in the order of address) from small to large).

Shielded cable connection

with the shield of the shielded cable.

Transmission line for centralized control

Daisy-chain terminals M1 and M2 on the terminal block for transmission line for centralized control (TB7) on the outdoor units (OC) in different refrigerant circuits and on the OC and OS in the same re-frigerant circuit. (Note b)

If a power supply unit is not connected to the transmission line for centralized control, replace the power jumper connector on the control board from CN41 to CN40 on only one of the outdoor units. Set the central control switch (SW5-1) on the control board of all out-door units to "ON."

Note

b) If TB7's on the outdoor units in the same refrigerant circuit are not

daisy-chained, connect the transmission line for the central control system to TB7 of the OC. (Note a).To maintain the central control even during an OC failure or a power failure, connect TB7 on OC and OS together. (If there is a problem with the outdoor unit whose power jumper was moved from CN41 to CN40, central control is not

- possible, even if TB7's are daisy-chained.)
 When connecting TB7, only commence after checking that the voltage is below 20 VDC.
 - Only use shielded cables.

Shielded cable connection

Daisy-chain the S terminal on the terminal block (TB7) on the outdoor units (OC, OS) with the shield wire of the shielded cable. Short-circuit the earth terminal ($\frac{1}{11}$) and the S terminal on the terminal block (TB7) on the outdoor unit whose power jumper connector is mated with CN40.

MA remote controller wiring

Same as 2-7-1

When 2 remote controllers are connected to the system Same as 2-7-1

Group operation of indoor units

Same as 2-7-1

LOSSNAY connection

Connect terminals M1 and M2 on the terminal block (TB5) on the indoor units (IC) to the appropriate terminals on the terminal block for indoor-outdoor transmission line (TB5) on LOSSNAY (LC). (Non-po-

- Indoor units must be interlocked with the LOSSNAY unit using the system controller. (Refer to the operation manual for the system controller for the setting method.) Interlock setting from the remote controller is required if the ON/OFF remote controller alone is connected
- Switch setting

Address setting is required as follows:

(5)	Address	setting	method

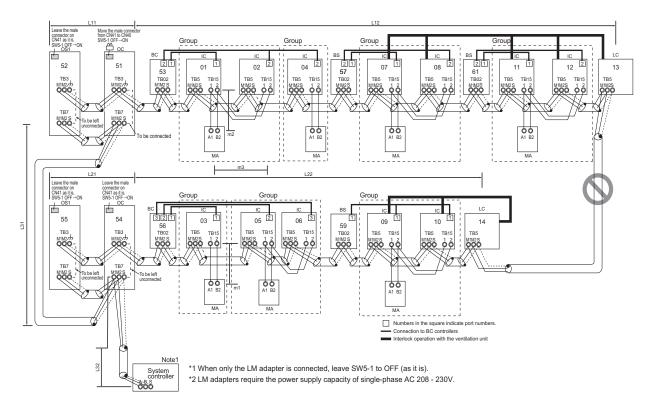
Proce- dures	Unit or controller			Address setting range	Setting method	Notes	Facto- ry set- ting	
1	Indoor unit	Main unit	IC	01 to 50	Assign the smallest address to the main unit in the group. In a system with a sub BC controller, make the settings for the indoor units in the following order. (i) Indoor unit to be connected to the main BC controller (ii) Indoor unit to be connected to sub BC controller 1 (iii) Indoor unit to be connected to sub BC controller 2 Make the settings for the indoor units in the way that the formula "(i) < (ii) < (iii)" is true.	Port number setting is required To perform a group operation of indoor units that feature different functions, designate the indoor unit in the group with the greatest number of functions as the main unit.	00	
		Sub unit			Assign sequential numbers starting with the address of the main unit in the same group +1. (Main unit address +1, main unit address +2, main unit address +3, etc.)			
2	LOSSNAY		LC	01 to 50	Assign an arbitrary but unique address to each of these units after assigning an address to all indoor units.	None of these addresses may overlap any of the indoor unit addresses.	00	
3	MA remote controller	Main remote con- troller	MA	No set- tings re- quired.	-	Make the same indoor unit group settings with the system controller as the ones that were made with the MA remote	Main	
		Sub remote con- troller	MA	Sub remote controller	Settings to be made with the Sub/ Main switch	controller. It is not possible to connect a pair of PAR-30MAAU.		
4	Outdoor unit		OC OS	51 to 100	Assign sequential address to the outdoor units in the same refrigerant circuit. The outdoor units are automatically designated as OC and OS.(Note)	To set the address to 100, set the rotary switches to 50. If the addresses that is assigned to the main BC controller overlaps any of the	00	
5	Auxiliary outdoor unit	outdoor troller (Sub)	loor troller (Sub)	Assign an address that equals the sum of the smallest address of the indoor units that are connected to the sub BC controller and 50.	addresses that are assigned to the outdoor units or to the sub BC controller, use a different, unused address with-			
	C. III	unit	BC control- ler (Main)	ВС		OC (or OS if it exists) +1	in the setting range. The use of a sub BC controller requires the connection of a main BC controller.	

Note

The outdoor units in the same refrigerant circuit are automatically designated as OC and OS.
They are designated as OC and OS in the descending order of capacity (ascending order of address if the capacities are the same).

2-7-6 System with Multiple BC Controllers

(1) Sample control wiring



(2) Cautions

- ME remote controller and MA remote controller cannot both be connected to the same group of indoor units.
- No more than 2 MA remote controllers can be connected to a group of indoor units. It is not possible to connect a pair of PAR-30MAAU.
- Do not connect the terminal blocks (TB5) on the indoor units that are connected to different outdoor units with each other.
- Replacement of male power jumper connector (CN41) must be performed only on one of the outdoor units.
- 5) Short-circuit the S (shield) terminal of the terminal block for the central control unit (TB7) and the ground terminal (,+,) on the outdoor unit whose power jumper was moved from CN41 to CN40.
- 6) When the number of the connected indoor units is as shown in the table below, one or more transmission boosters (sold separately) are required.

To connect two transmission boosters, connect them in parallel. (Observe the maximum number of connectable indoor units that are listed in the specifications for each outdoor unit.)

	Number of transmission booster (sold separately) required			
	1 unit	2 units		
When the P72 and P96 models are not included in the connected indoor units	27 - 50 units	-		
When the P72 and P96 models are included in the connected indoor units	21 - 39 units	40 - 50 units		

- •The table above shows the number of transmission boosters that is required by the system with three BC controllers. For each BC controller that is subtracted from the abovementioned system, two additional indoor units can be connected.
- •Refer to the DATABOOK for further information about how many booster units are required for a given system.
- When a power supply unit is connected to the transmission line for centralized control, leave the power jumper connec-

tor on CN41 as it is (factory setting).

(3) Maximum allowable length

- Indoor/outdoor transmission line
 Maximum distance (1.25mm² [AWG16] or larger)
 L11+L12≤200m [656ft]
 L21+L22≤200m [656ft]
- Transmission line for centralized control L31+L32(L21) ≤200m [656ft]
- 3) MA remote controller wiring

 Maximum overall line length
 (0.3 to 1.25mm² [AWG22 to 16])

 m1≤200m [656ft]

 m2+m3≤200m [656ft]
- 4) Maximum line distance via outdoor unit (1.25mm² [AWG16] or larger) L32+L31+L12(L11) ≤500m [1640ft] L32+L22(L21) ≤500m [1640ft] L12(L11)+L31+L22(L21) ≤500m[1640ft]

1) Indoor/outdoor transmission line

Daisy-chain terminals M1 and M2 of the terminal block for indoor-outdoor transmission line (TB3) on the outdoor units (OC and OS) (Note a), of the terminal block for indoor-outdoor transmission line (TB02) on the main and sub BC controllers (BC and BS), and of the terminal block for indoor-outdoor transmission line (TB5) on each indoor unit (IC). (Non-polarized two-wire)

Only use shielded cables.

Note

a) The outdoor units in the same refrigerant circuit are automatically designated as OC and OS in the order of capacity from large to small (if two or more units have the same capacity, in the order of address from small to large).

Shielded cable connection

Daisy-chain the ground terminal (H) on the outdoor units (OC and OS), the S terminal of the terminal block (TB02) on the BC and BS, and the S terminal of the terminal block (TB5) on the indoor unit (IC) with the shield of the shielded cable.

2) Transmission line for centralized control

Daisy-chain terminals A and B of the system controller, M1 and M2 terminals of TB7 (terminal block for centralized control system connection) on the outdoor units (OC) in different refrigerant systems, and M1 and M2 terminals of TB7 (terminal block for centralized control system connection) on the outdoor units (OC and OS) in the same refrigerant circuit. (Note b)

If a power supply unit is not connected to the transmission line for centralized control, replace the power jumper connector on the control board from CN41 to CN40 on only one of the outdoor units.

When connecting a system controller, set the centralized control switch (SW5-1) on the control board of all indoor units to "ON."

Note

b) If TB7's on the outdoor units in the same refrigerant cir-

cuit are not daisy-chained, connect the transmission line for the central control system to TB7 of the OC. (Note a). To maintain the central control even during an OC failure or a power failure, connect TB7 on OC and OS together. (If there is a problem with the outdoor unit whose power jumper was moved from CN41 to CN40, central control is not possible, even if TB7's are daisy-chained.)

- c) When connecting TB7, only commence after checking that the voltage is below 20 VDC.
 - Only use shielded cables.

Shielded cable connection

Daisy-chain the S terminal of the terminal block (TB7) on the system controller, OC, and OS with the shield of the shielded cable. Short-circuit the earth terminal (H) and the S terminal on the terminal block (TB7) on the outdoor unit whose power jumper connector is mated with CN40.

3) MA remote controller wiring

Same as 2-7-1

When 2 remote controllers are connected to the system

Same as 2-7-1

Group operation of indoor units

Same as 2-7-1

4) LOSSNAY connection

Connect terminals M1 and M2 on the terminal block (TB5) on the indoor unit (IC) to the appropriate terminals on the terminal block for indoor-outdoor transmission line (TB5) on LOSSNAY (LC). (Non-polarized two-wire)

- •Indoor units must be interlocked with the LOSSNAY unit using the system controller. (Refer to the operation manual for the system controller for the setting method.) Interlock setting from the remote controller is required if the ON/OFF remote controller alone or the LM adapter alone is connected.
- Switch setting

Address setting is required as follows.

(5) Address setting method

Pro- ce- dur es	Unit or controller			Address setting range	Setting method	Notes	Fac- tory set- ting
1	Indoor unit	Main unit	IC	01 to 50	Assign the smallest address to the main unit in the group. In a system with a sub BC controller, make the settings for the indoor units in the following order. Indoor unit to be connected to the main BC controller Indoor unit to be connected to sub BC controller Indoor unit to be connected to sub BC controller 1 Indoor unit to be connected to sub BC controller 2 Make the settings for the indoor units in the way that the formula "(i) < (ii) < (iii)" is true. Assign sequential numbers starting with the address of the main unit in the same group +1. (Main unit address +1, main unit address +2, main unit address +3, etc.)	Port number setting is required To perform a group operation of indoor units that feature different functions, designate the indoor unit in the group with the greatest number of functions as the main unit.	00
2	2 LOSSNAY LC		LC	01 to 50	Assign an arbitrary but unique address to each of these units after assigning an address to all indoor units.	None of these addresses may overlap any of the indoor unit addresses.	00
3	MA remote control-	Main re- mote controller	MA	No set- tings re- quired.	-	Make the same indoor unit group settings with the system controller as the ones that were made with the MA remote controller.	Main
	ler	Sub re- mote con- troller	MA	Sub re- mote controller	Settings to be made with the Sub/Main switch	It is not possible to connect a pair of PAR-30MAAU.	
4			OC OS	51 to 100	The sum of the smallest address of the indoor units in the same system and 50. Assign sequential address to the outdoor units in the same refrigerant circuit. The outdoor units are automatically designated as OC and OS.	•To set the address to 100, set the rotary switches to 50.	00
5	Auxilia- ry out- door	BC controller (Sub)	BS	51 to 100	Assign an address that equals the sum of the smallest address of the indoor units that are connected to the sub BC controller and 50.	To set the address to 100, set the rotary switches to 50. If the addresses that is assigned to the main PC controller.	00
	unit	BC controller (Main)	BC 51 to 100 OC (or OS if it exists) +1 to the main BC con laps any of the add are assigned to the units or to the sub ler, use a different, dress within the set •The use of a sub BC requires the connection.	to the main BC controller over- laps any of the addresses that are assigned to the outdoor units or to the sub BC control- ler, use a different, unused ad- dress within the setting range. The use of a sub BC controller requires the connection of a main BC controller.			

Note

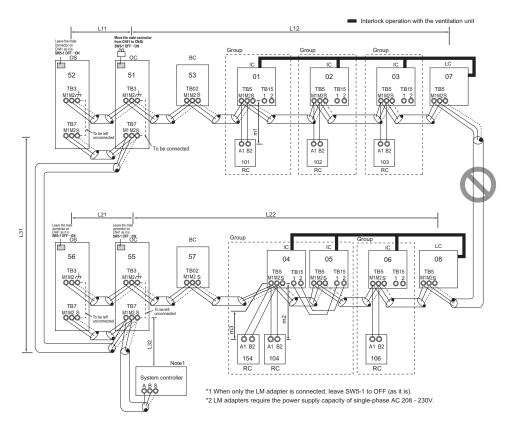
The outdoor units in the same refrigerant circuit are automatically designated as OC and OS.

They are designated as OC and OS in the descending order of capacity (ascending order of address if the capacities are the same).

2-8 Example System with an ME Remote Controller

2-8-1 System with a Connection of System Controller to Centralized Control Transmission Line

(1) Sample control wiring



(2) Cautions

- ME remote controller and MA remote controller cannot both be connected to the same group of indoor units.
- No more than 2 ME remote controllers can be connected to a group of indoor units.
- Do not connect the terminal blocks (TB5) on the indoor units that are connected to different outdoor units with each other.
- 4) Replace the power jumper connector of the control board from CN41 to CN40 on only one of the outdoor units.
- Provide an electrical path to ground for the S terminal on the terminal block for centralized control on only one of the outdoor units
- 6) When the number of the connected indoor units is as shown in the table below, one or more transmission boosters (sold separately) are required.

To connect two transmission boosters, connect them in parallel. (Observe the maximum number of connectable indoor units that are listed in the specifications for each outdoor unit.)

	Number of transmission booster (sold separately) required			
	1 unit	2 units	3 units	
When the P72 and P96 models are not included in the connected indoor units	15 - 34 units	35 - 50 units	-	
When the P72 and P96 models are included in the connected indoor units	11 - 26 units	27 - 42 units	43 - 50 units	

•The left table shows the number of transmission boosters

- that is required by the system with three BC controllers. For each BC controller that is subtracted from the above-mentioned system, two additional indoor units can be connected.
- •Refer to the DATABOOK for further information about how many booster units are required for a given system.
- When a power supply unit is connected to the transmission line for centralized control, leave the power jumper connector on CN41 as it is (factory setting).

(3) Maximum allowable length

- 1) Indoor/outdoor transmission line
 - Same as 2-7-3
- 2) Transmission line for centralized control

Same as 2-7-4

3) ME remote controller wiring

Maximum overall line length (0.3 to 1.25mm² [AWG22 to 16]) m1 \leq 10m [32ft] m2+m3 \leq 10m [32ft]

If the standard-supplied cable must be extended, use a cable with a diameter of 1.25mm² [AWG16]. The section of the cable that exceeds 10m [32ft] must be included in the maximum indoor-outdoor transmission line distance described in (1).

When connected to the terminal block on the Simple remote controller, use cables that meet the following cable size specifications: 0.75 - 1.25 mm² [AWG18-16].

4) Maximum line distance via outdoor unit (1.25 mm² [AWG16] or large)

Same as 2-7-4

1) Indoor/outdoor transmission line

Same as 2-7-2

Shielded cable connection

Same as 2-7-2

2) Transmission line for centralized control

Same as 2-7-4

Shielded cable connection

Same as 2-7-4

3) ME remote controller wiring

ME remote controller is connectable anywhere on the indoor-outdoor transmission line.

When 2 remote controllers are connected to the system

Refer to the section on Switch Setting.

Performing a group operation (including the group operation of units in different refrigerant circuits).

Refer to the section on Switch Setting.

4) LOSSNAY connection

Same as 2-7-4

5) Switch setting

Address setting is required as follows.

(5) Address setting method

Proce- dures	Unit or controller			Ad- dress setting range	Setting method	Notes	Fac- tory set- ting
1	unit		IC	01 to 50	Assign the smallest address to the main unit in the group. In a system with a sub BC controller, make the settings for the indoor units in the following order. (i) Indoor unit to be connected to the main BC controller (ii) Indoor unit to be connected to sub BC controller 1 (iii) Indoor unit to be connected to sub BC controller 2 Make the settings for the indoor units in the way that the formula "(i) < (ii) < (iii)" is true.	Port number setting is required To perform a group operation of indoor units that have different functions, set the indoor unit in the group with the greatest number of functions as the main unit.	00
		Sub unit			Assign sequential numbers starting with the address of the main unit in the same group +1. (Main unit address +1, main unit address +2, main unit address +3, etc.)		
2	LOSSNAY		LC	01 to 50	Assign an arbitrary but unique address to each of these units after assigning an address to all indoor units.	None of these addresses may overlap any of the indoor unit addresses.	00
3	ME remote controller	Main remote con- troller	RC	101 to 150	Add 100 to the main unit address in the group	*It is not necessary to set the 100s digit. *To set the address to 200, set the rotary switches to 00.	101
		Sub remote con- troller	RC	151 to 200	Add 150 to the main unit address in the group	secure rotary switches to ou.	
4	Outdoor unit		OC OS	51 to 100	Assign sequential address to the outdoor units in the same refrigerant circuit. The outdoor units are automatically designated as OC and OS.(Note)	To set the address to 100, set the rotary switches to 50. If the addresses that is assigned to the main BC controller overlaps any of the	00
5	Auxiliary outdoor unit	BCcontroler (Sub)	BS BC	51 to 100	Assign an address that equals the sum of the smallest address of the indoor units that are connected to the sub BC controller and 50. OC (or OS if it exists) +1	addresses that are assigned to the outdoor units or to the sub BC controller, use a dif- ferent, unused address with- in the setting range.	
		ler (Main)	БС		00 (01 00 II II exists) + 1	The use of a sub BC controller requires the connection of a main BC controller.	

Note

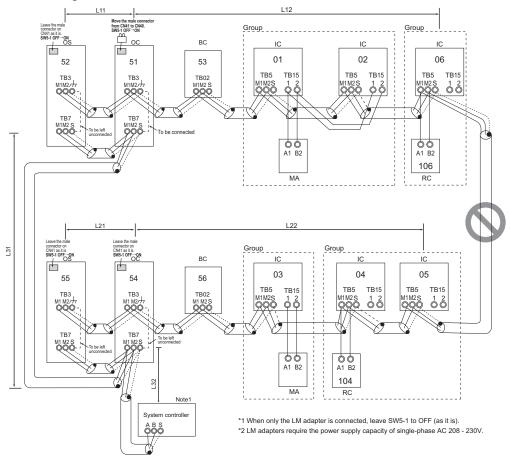
The outdoor units in the same refrigerant circuit are automatically designated as OC and OS.

They are designated as OC and OS in the descending order of capacity (ascending order of address if the capacities are the same).

2-9 Example System with an MA and an ME Remote Controller

2-9-1 System with a Connection of System Controller to Centralized Control Transmission Line

(1) Sample control wiring



(2) Cautions

- Be sure to connect a system controller.
- ME remote controller and MA remote controller cannot both be connected to the same group of indoor units.
- Assign to the indoor units connected to the MA remote controller addresses that are smaller than those of the indoor units that are connected to the ME remote controller.
- No more than 2 ME remote controllers can be connected to a group of indoor units.
- No more than 2 MA remote controllers can be connected to a group of indoor units. It is not possible to connect a pair of PAR-30MAAU.
- 6) Do not connect the terminal blocks (TB5) on the indoor units that are connected to different outdoor units with each other.
- Replace the power jumper connector of the control board from CN41 to CN40 on only one of the outdoor units.
- Provide an electrical path to ground for the S terminal on the terminal block for centralized control on only one of the outdoor units.
- When the number of the connected indoor units is as shown in the table below, one or more transmission boosters (sold separately) are required.
 - To connect two transmission boosters, connect them in parallel.

 (Observe the maximum number of connectable indoor units that are

listed in the specifications for each outdoor unit.)

	Number of transmission booster (sold separately) required		
	1 unit	2 units	3 units
When the P72 and P96 models are not included in the connected indoor units	15 - 34 units	35 - 50 units	-
When the P72and P96 models are included in the connected indoor units	11 - 26 units	27 - 42 units	43 - 50 units

- •The left table shows the number of transmission boosters that is required by the system with three BC controllers. For each BC controller that is subtracted from the above-mentioned system, two additional indoor units can be connected.
- •Refer to the DATABOOK for further information about how many booster units are required for a given system.
- 10) When a power supply unit is connected to the transmission line for centralized control, leave the power jumper connector on CN41 as it is (factory setting).

(3) Maximum allowable length

- Indoor/outdoor transmission line Same as 2-7-3
- 2) Transmission line for centralized control Same as 2-7-4
- 3) MA remote controller wiring Same as 2-7-1
- 4) ME remote controller wiring Same as 2-8
- Maximum line distance via outdoor unit (1.25 mm² [AWG16] or larger)
 Same as 2-7-4

(4) Wiring method

1) Indoor/outdoor transmission line Same as 2-7-2

Shielded cable connection

Same as 2-7-2

2) Transmission line for centralized control

Same as 2-7-4

Shielded cable connection

Same as 2-7-4

3) MA remote controller wiring

(When 2 remote controllers are connected to the system) (Group operation of indoor units)

Same as 2-7-1

4) ME remote controller wiring (When 2 remote controllers are connected to the system)

(Group operation of indoor units) Same as 2-8

5) LOSSNAY connection

Same as 2-7-4

6) Switch setting

Address setting is required as follows.

(5) Address setting method

Pro- ce- dure s	U				Ad-			
		nit or cor	ntroller		dress set- ting range	Setting method	Notes	Facto- ry set- ting
1	Operation with the MA remote controller	In- door unit	Main unit	IC	01 to 50	Assign the smallest address to the main unit in the group. In a system with a sub BC controller, make the settings for the indoor units in the following order. Indoor unit to be connected to the main BC controller Indoor unit to be connected to sub BC controller Indoor unit to be connected to sub BC controller Indoor unit to be connected to sub BC controller Make the settings for the indoor units in the way that the formula "(i) < (ii) < (iii)" is true.	Assign an address smaller than that of the indoor unit that is connected to the ME remote controller. Enter the same indoor unit group settings on the system controller as the ones that were entered on the MA remote controller. To perform a group operation of indoor units that have different functions, designate the indoor unit in the group with the greatest number of functions as the main unit. Port number setting is required.	00
			Sub unit	IC	01 to 50	Assign sequential numbers starting with the address of the main unit in the same group +1. (Main unit address +1, main unit address +2, main unit address +3, etc.)		
		MA re- mote con-	Main re- mote control- ler	MA	No set- tings re- quired.	-	It is not possible to connect a pair of PAR-30MAAU.	Main
		troller	Sub remote control- ler	MA	Sub remote control- ler	Settings to be made according to the remote controller function selection		
2	Opera- tion with the	In- door unit	Main unit	IC	01 to 50	Assign the smallest address to the main unit in the group.	Assign an address higher than those of the indoor units that are connected to the MA remote controller.	00
	ME re- mote controller	uiii	Sub unit	IC	01 to 50	Assign sequential numbers starting with the address of the main unit in the same group +1. (Main unit address +1, main unit address +2, main unit address +3, etc.)	Make the initial settings for the indoor unit group settings via the system controller. To perform a group operation of indoor units that have different functions, designate the indoor unit in the group with the greatest number of functions as the main unit. Port number setting is required. Addresses that are assigned to the indoor units that are connected to the sub BC controller should be higher than the addresses that are assigned to the indoor units that are connected to the main BC controller.	
		ME re- mote con-	Main re- mote control- ler	RC	101 to 150	Add 100 to the main unit address in the group.	It is not necessary to set the 100s digit. To set the address to 200, set it to 00.	101
		troller	Sub remote control- ler	RC	151 to 200	Add 150 to the main unit address in the group.		
3	LOSSNAY		LC	01 to 50	Assign an arbitrary but unique address to each of these units after assigning an address to all indoor units.	None of these addresses may over- lap any of the indoor unit addresses.	00	
4	Outdoor unit		OC OS	51 to 100	*Assign sequential address to the outdoor units in the same refrigerant circuit. *The outdoor units are automatically designated as OC and OS.(Note)	To set the address to 100, set it to 50. If the addresses that is assigned to the main BC controller overlaps any of the addresses that are assigned to the outdoor units or to the sub BC controller, use a different, unused address within the setting range.	00	
5	Auxiliary outdoor unit	BCcontro	oller (Sub)	BS	51 to 100	Assign an address that equals the sum of the smallest address of the indoor units that are connected to the sub BC controller and 50.	The use of a sub BC controller requires the connection of a main BC controller.	
		BC contr (Main)	oller	ВС		OC (or OS if it exists) +1		

Note

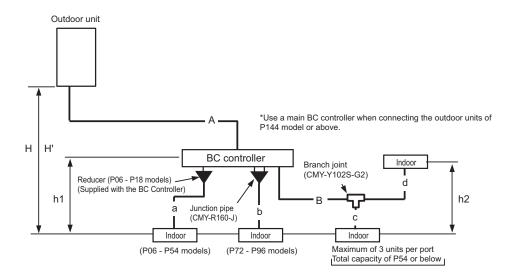
The outdoor units in the same refrigerant circuit are automatically designated as OC and OS.

They are designated as OC and OS in the descending order of capacity (ascending order of address if the capacities are the same).

2-10 Restrictions on Refrigerant Pipes

2-10-1 Restrictions on Refrigerant Pipe Length

(1) System that requires 16 BC controller ports or fewer <System with only the main BC controller or standard BC controller>



Unit: m [ft]

	Operation		Pipe sections	Allowable length of pipes
Length	Total pipe length		A+B+a+b+c+d	Refer to the restrictions on the total piping length in the graph on the next page.
	Total pipe length fro to the farthest indo	om the outdoor unit or unit	A+B+d	165 [541] or less (Equivalent length 190 [623] or less)
	Between outdoor unit and BC controller		А	110 [360] or less
	Between BC controller and indoor unit		B+d	40 [131] or less*1
Height difference	Between indoor	Outdoor unit above indoor unit	Н	50 [164] or less
	and outdoor units	Outdoor unit be- low indoor unit	H'	40 [131] or less
	Between indoor unit and BC controller		h1	15[49](10[32]) or less ^{*2}
	Between indoor un	its	h2	15[49](10[32]) or less *2

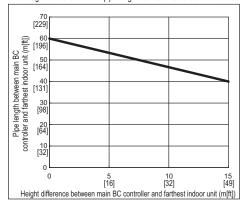
^{*1.} When the overall pipe length between the BC controller and the farthest indoor unit exceeds 40m [131ft], observe the restrictions in the figure titled "Restrictions on pipe length" below. (Except the P96 models)

*2. When the capacity of the connected indoor units is P72 or above, use the figures in the parentheses as a reference.

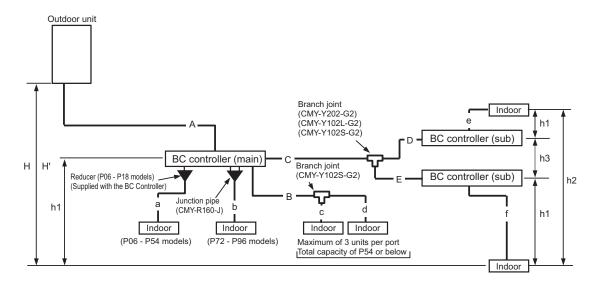
Note

- To connect the P72 through P96 models of indoor units, use an optional twinning pipe kit (Model: CMY-R160-J) and merge
 the two ports before connecting them.
- 2) Do not connect the P72 or P96 models of indoor units and other models of indoor units at the same port.
- 3) Note the following when connecting multiple indoor units to a single port.
 - •Those indoor units connected to the same port must be installed in the same room.
 - •Set the indoor temperature via the connected remote controller, and when connecting multiple remote controllers, configure these controllers as a group by making appropriate settings. These indoor units can only be operated in the same mode.

■The height difference and the pipe length between BC controller and indoor units



(2) System that requires more than 16 BC controller ports or with multiple BC controllers <Outdoor unit HP96 model or below>



Unit: m [ft]

	Operation Pipe sections		Pipe sections	Allowable length of pipes
Length	Total pipe length		A+B+C+D+E+a+b+c+d+e+f	Refer to the restrictions on the total piping length in the graphon the next page.
	Total pipe length from the out- door unit to the farthest indoor unit		A+C+E+f	165 [541] or less (Equivalent length 190 [623] or less)
	Between outdoor controller	unit and BC	Α	110 [360] or less
	Between BC controller and indoor unit		B+d or C+D+e or C+E+f	40 [131] or less*1
Height differ-ence	Between indoor	Outdoor unit above indoor unit	Н	50 [164] or less
	units	Outdoor unit below in- door unit	H'	40 [131] or less
	Between indoor unit and BC controller		h1	15 [49](10[32]) or less ^{*2}
	Between indoor units		h2	15 [49](10[32]) or less *2
	Between the BC controller (main or sub) and the sub BC controller		h3	15 [49] or less

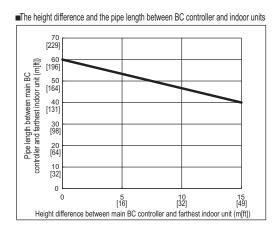
^{*1.} When the overall pipe length between the BC controller and the farthest indoor unit exceeds 40m [131ft], observe the restrictions in the figure titled "Restrictions on pipe length" below. (Except the P96 models)

^{*2.} When the capacity of the connected indoor units is P72 or above, use the figures in the parentheses as a reference.

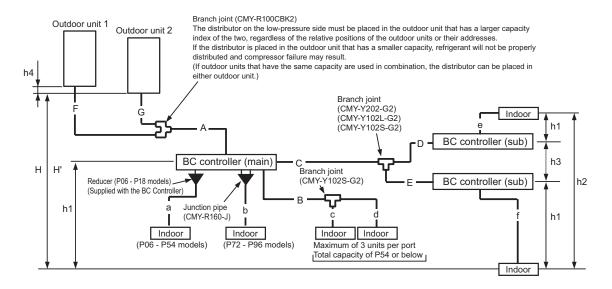
Note

- 1) A system that requires more than 16 BC controller ports requires two or three BC controllers (main and sub), and three pipes will be used between the main and the sub BC controllers.
- 2) When connecting two sub BC controllers, observe the maximum allowable length in the table above.
- 3) When connecting two sub BC controllers, install them in parallel.
- 4) To connect the P72 through P96 models of indoor units, use an optional twinning pipe kit (Model: CMY-R160-J) and merge the two ports before connecting them.
- 5) Do not connect the P72 or P96 models of indoor units and other models of indoor units at the same port.
- 6) Note the following when connecting multiple indoor units to a single port.
 - •Those indoor units connected to the same port must be installed in the same room.
 - •Set the indoor temperature via the connected remote controller, and when connecting multiple remote controllers, configure these controllers as a group by making appropriate settings. These indoor units can only be operated in the same mode.
- 7) The maximum capacity of the indoor units that is connectable to the CMB-P-NU-GB types of sub BC controllers is P126 or below (when two GB type controllers are connected P126 or below for both combined).

The maximum total capacity of indoor units that is connectable to the sub BC controller CMB-P1016NU-HB is P126 or below. If at least one CMB-P1016NU-HB unit is connected, the maximum total capacity of connectable indoor units to a system with two sub controllers is P168 or below.



(3) System that requires more than 16 BC controller ports or with multiple BC controllers <Two-outdoor-unit system>



Unit: m [ft]

	Operation		Pipe sections	Allowable length of pipes
Length	Total pipe length		F+G+A+B+C+D+E+a+b+c+d+e +f	Refer to the restrictions on the total piping length in the graph on the next page.
	Total pipe length from the out- door unit to the farthest indoor unit		F(G)+A+C+E+f	165 [541] or less (Equivalent length 190 [623] or less)
	Between outdoor controller	unit and BC	F(G)+A	110 [360] or less
	Between BC controller and in- door unit		B+d or C+D+e or C+E+f	40 [131] or less*1
	Between indoor units		F+G	5 [16] or less
Height differ-ence	Between indoor	Outdoor unit above indoor unit	Н	50 [164] or less
	units	Outdoor unit below in- door unit	H'	40 [131] or less
	Between indoor unit and BC controller		h1	15 [49](10[32]) or less ^{*2}
	Between indoor units		h2	15 [49](10[32]) or less *2
	Between the BC controller (main or sub) and the sub BC controller		h3	15 [49] or less
	Between outdoor	units	h4	0.1 [0.3] or less

^{*1.} When the overall pipe length between the BC controller and the farthest indoor unit exceeds 40m [131ft], observe the restrictions in the figure titled "Restrictions on pipe length" below. (Except the P96 models)

^{*2.} When the capacity of the connected indoor units is P72 or above, use the figures in the parentheses as a reference.

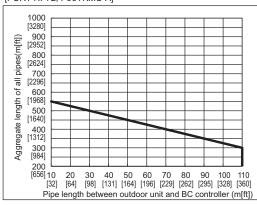
Note |

- A system that requires more than 16 BC controller ports requires two or three BC controllers (main and sub), and three pipes will be used between the main and the sub BC controllers.
- 2) When connecting two sub BC controllers, observe the maximum allowable length in the table above.
- 3) When connecting two sub BC controllers, install them in parallel.
- 4) To connect the P72 through P96 models of indoor units, use an optional twinning pipe kit (Model: CMY-R160-J) and merge the two ports before connecting them.
- 5) Do not connect the P72 or P96 models of indoor units and other models of indoor units at the same port.
- 6) Note the following when connecting multiple indoor units to a single port.
 - •Those indoor units connected to the same port must be installed in the same room.
 - •Set the indoor temperature via the connected remote controller, and when connecting multiple remote controllers, configure these controllers as a group by making appropriate settings. These indoor units can only be operated in the same mode.
- 7) The maximum capacity of the indoor units that is connectable to the CMB-P-NU-GB types of sub BC controllers is P126 or below (when two GB type controllers are connected P126 or below for both combined).

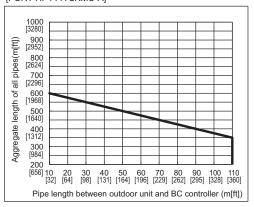
The maximum total capacity of indoor units that is connectable to the sub BC controller CMB-P1016NU-HB is P126 or below. If at least one CMB-P1016NU-HB unit is connected, the maximum total capacity of connectable indoor units to a system with two sub controllers is P168 or below.

■ Restrictions on pipe length

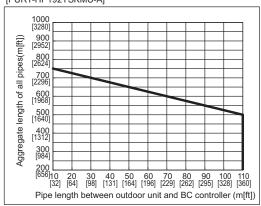
[PURY-HP72, P96TKMU-A-H] [PURY-HP72, P96YKMU-A]



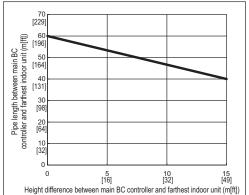
[PURY-HP144TSKMU-A-H] [PURY-HP144YSKMU-A]



[PURY-HP192TSKMU-A-H] [PURY-HP192YSKMU-A]



■ The height difference and the pipe length between BC controller and indoor units



2-10-2 Restrictions on Refrigerant Pipe Size

(1) Between outdoor unit and the first twinning pipe (Part A)

Unit: mm [inch]

Outdoor units	Refrigerant pipe size		Connection to outdoor unit and BC controller		
Outdoor units	Low-pressure pipe	High-pressure pipe	Low-pressure pipe	High-pressure pipe	
72	ø19.05 [3/4"]	ø15.88 [5/8"]	ø19.05 [3/4"]	ø15.88 [5/8"]	
96	ø22.2 [7/8"]	ø19.05 [3/4"]	ø22.2 [7/8"]	ø19.05 [3/4"]	
144	ø28.58 [1-1/8"]	ø22.2[7/8"]	ø28.58 [1-1/8"]	ø22.2 [7/8"]	
192	<u> </u>	<u> </u>	\$20.00 [1-1/0]	Ø22.2 [170]	

(2) Between BC controller and indoor unit (Sections a, b, c, d, e, and f)

Unit: mm [inch]

Indoor unit	Refrigerant pipe size		Indoor unit connection (Flare connection for all models)		
	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	
P06, P08, P12, P15, P18	ø6.35 [1/4"]	ø12.7 [1/2"]	ø6.35 [1/4"]	ø12.7 [1/2"]	
P24, P27, P30	ø9.52 [3/8"]	ø15.88 [5/8"]	ø9.52 [3/8"]	ø15.88 [5/8"]	
P36, P48, P54	99.32 [3/0]				
P72		ø19.05 [3/4"]		ø19.05 [3/4"]	
P96	ø12.7 [1/2"]	ø22.2 [7/8"]	ø12.7 [1/2"]	ø22.2 [7/8"]	

(3) Between the main and sub BC controllers (Section C)

Unit: mm [inch]

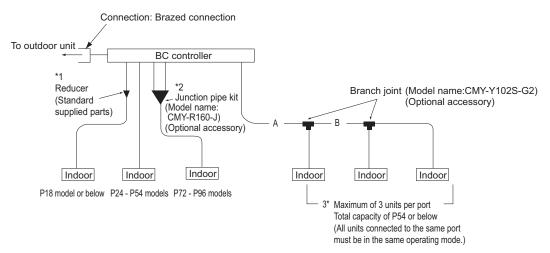
Indoor unit	Refrigerant pipe size (Brazed connection on all models)				
maoor anit	Liquid pipe	High-pressure gas pipe	Low-pressure gas pipe		
- P72	ø9.52 [3/8"]	ø15.88 [5/8"]	ø19.05 [3/4"]		
P73 - P108	<u> </u>	ø19.05 [3/4"]	ø22.2 [7/8"]		
P109 - P126	ø12.7 [1/2"]	919.03[3/4]			
P127 - P144	912.7 [1/2]	ø22.2 [7/8"]	ø28.58 [1-1/8"]		
P145 - P168	ø15.88 [5/8"]	922.2 [110]			

Select the proper size pipes for the main unit based on the total capacity of the indoor units that are connected to both sub BC controllers. Select the proper size pipes for the sub controller side based on the total capacity of the indoor units that are connected to the sub controller.

2-10-3 BC Controller Connection Method

(1) Size of the pipe that fits the standard BC controller ports

HP72 - HP96 models



The ports of the BC controller accommodates the pipes on P24 - P54 models of indoor units. To connect other types of indoor units, follow the procedure below.

	Operation	Pipe sections		
Operation		High-pressure side (gas)	Low-pressure side (gas)	
Outdoor unit side	PURY-HP72TKMU-A-H PURY-HP72YKMU-A	ø15.88 [5/8"] (Brazed connection)	ø19.05 [3/4"] (Brazed connection)	
PURY-HP96TKMU-A-H PURY-HP96YKMU-A		ø19.05 [3/4"] (Brazed connection)	ø22.2 [7/8"] (Brazed connection)	
Inc	door unit side	ø9.52 [3/8"] (Flare connection)	ø15.88 [5/8"] (Flare connection)	

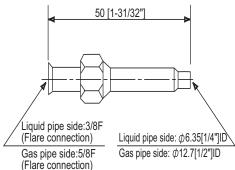
^{*} BC controllers can only be connected to HP72 - HP96 models of outdoor units.

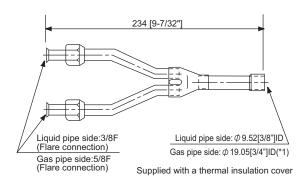
Note

To connect P06 - P18 models of indoor units use the reducer that is supplied with the BC controller.

Note

To connect P72 - P96 models of indoor units (or when the total capacity of indoor units exceeds P55), use a junction pipe kit and merge the two nozzles.





Note) Use the flare nut that is supplied with the BC controller.

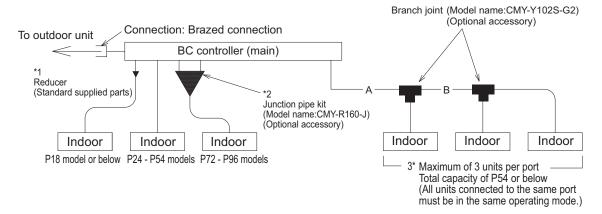
Note

- 3) To connect multiple indoor units to a port (or to a junction pipe)
 - •Maximum total capacity of connected indoor units: P54 or below (in a system with a junction pipe: P96 or below)
 - •Maximum number of connectable indoor units: 3 units
 - •Branch joint: Use CMY-Y102S-G2 (optional accessory).
 - •Refrigerant pipe selection (size of the pipes A and B in the previous page): Select the proper size pipes based on the total capacity of the downstream indoor units, using the table below as a reference.

Total capacity of indoor units	Liquid pipe	Gas pipe
P54 or below	ø9.52 [3/8"]	ø15.88 [5/8"]
P55 - P72	ø9.52 [3/8"]	ø19.05 [3/4"]
P73 - P96	ø9.52 [3/8"]	ø22.2 [7/8"]

(2) Size of the pipe that fits the main BC controller ports

HP72 - HP192 models



The ports of the BC controller accommodates the pipes on P24 - P54 models of indoor units. To connect other types of indoor units, follow the procedure below.

Note

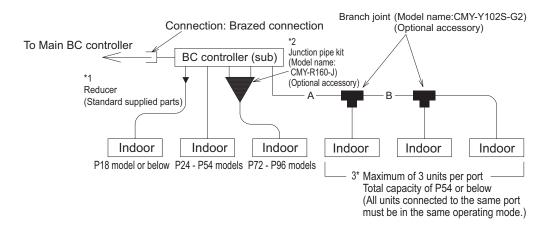
- 1) To connect P06 P18 models of indoor units use the reducer that is supplied with the BC controller.
- 2) To connect the P72 through P96 models of indoor units (or when the total capacity of indoor units is P55 or above), use an optional twinning pipe kit (Model: CMY-R160-J) to merge two ports before connecting them.
- 3) To connect multiple indoor units to a port (or to a junction pipe)
 - •Maximum total capacity of connected indoor units: P54 or below (in a system with a junction pipe: P96 or below)
 - •Maximum number of connectable indoor units: 3 units
 - *Branch joint: Use CMY-Y102S-G2 (optional accessory).
 - •Refrigerant pipe selection (size of the pipes in sections A and B in the figure above): Select the proper based on the total capacity of the downstream indoor units, using the table below as a reference.

Unit: mm [inch]

Total capacity of indoor units	Liquid pipe	Gas pipe
P54 or below	ø9.52 [3/8"]	ø15.88 [5/8"]
P55 - P72	ø9.52 [3/8"]	ø19.05 [3/4"]
P73 - P96	ø9.52 [3/8"]	ø22.2 [7/8"]

Operation		Pipe s	ections
	Operation	High pressure side (Liquid)	Low-pressure side (Gas)
Outdoor unit side	PURY-HP72TKMU-A-H PURY-HP72YKMU-A	ø15.88 [5/8"] (Brazed connection)	ø19.05 [3/4"] (Brazed connection)
	PURY-HP96TKMU-A-H PURY-HP96YKMU-A	ø19.05 [3/4"] (Brazed connection)	ø22.2 [7/8"] (Brazed connection)
	PURY-HP144TSKMU-A-H PURY-HP144YSKMU-A	ø22.2 [7/8"]	ø28.58 [1-1/8"]
	PURY-HP192TSKMU-A-H PURY-HP192YSKMU-A	(Brazed connection)	(Brazed connection)
	Indoor unit side	ø9.52 [3/8"] (Flare connection)	ø15.88 [5/8"] (Flare connection)

(3) Size of the pipe that fits the sub BC controller ports



The ports of the BC controller accommodates the pipes on P24 - P54 models of indoor units. To connect other types of indoor units, follow the procedure below.

Note

- 1) To connect P06 P18 models of indoor units use the reducer that is supplied with the BC controller.
- 2) To connect the P72 through P96 models of indoor units (or when the total capacity of indoor units is P55 or above), use an optional twinning pipe kit (Model: CMY-R160-J) to merge two ports before connecting them.
- 3) To connect multiple indoor units to a port (or to a junction pipe)
 - •Maximum total capacity of connected indoor units: P54 or below (in a system with a junction pipe: P96 or below)
 - •Maximum number of connectable indoor units: 3 units
 - *Branch joint: Use CMY-Y102S-G2 (optional accessory).
 - •Refrigerant pipe selection (size of the pipes in sections A and B in the figure above): Select the proper based on the total capacity of the downstream indoor units, using the table below as a reference.

Unit: mm [inch]

Total capacity of indoor units	Liquid pipe	Gas pipe	
P54 or below	ø9.52 [3/8"]	ø15.88 [5/8"]	
P55 - P72	ø9.52 [3/8"]	ø19.05 [3/4"]	
P73 - P96	ø9.52 [3/8"]	ø22.2 [7/8"]	

Operation		Pipe sections		
	Total capacity of the indoor units that are connected to the BC controller	High-pressure side (liquid)	Low-pressure side (gas)	Liquid pipe side
On the BC controller side	P72 model or below	ø15.88 [5/8"] (Brazed connection)	ø19.05 [3/4"] (Brazed connection)	ø9.52 [3/8"] (Brazed connection)
	P73 - P108	ø19.05 [3/4"] (Brazed connection)	ø22.2 [7/8"] (Brazed connection)	
	P109 - P126	(Brazea connection)	ø28.58 [1-1/8"] (Brazed connection)	ø12.7 [1/2"] (Brazed connection)
	P127 - P144	ø22.2 [7/8"]		
	P145 - P168	(Brazed connection)		ø15.88 [5/8"] (Brazed connection)

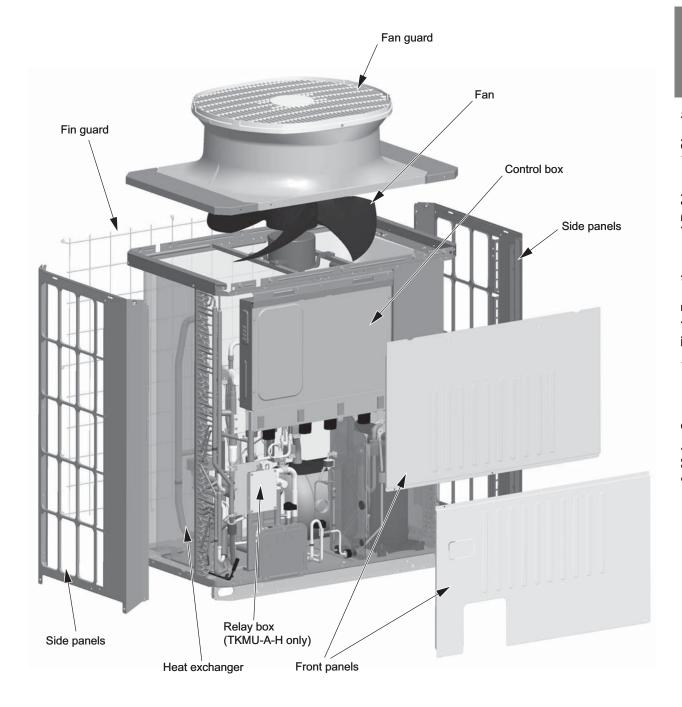
Chapter 3 Major Components, Their Functions and Refrigerant Circuits

3-1	External Appearance and Refrigerant Circuit Components of Outdoor Unit	. 65
3-1-1	External Appearance of Outdoor Unit	. 65
3-1-2	Outdoor Unit Refrigerant Circuits	. 66
3-2	Outdoor Unit Refrigerant Circuit Diagrams	. 67
3-3	Functions of the Major Components of Outdoor Unit	. 69
3-4	Functions of the Major Components of Indoor Unit	. 72
3-5	External Appearance and Refrigerant Circuit Components of BC Controller	. 73
3-6	BC Controller Refrigerant Circuit Diagrams	. 76
3-7	Functions of the Major Components of BC Controller	. 79

3-1 External Appearance and Refrigerant Circuit Components of Outdoor Unit

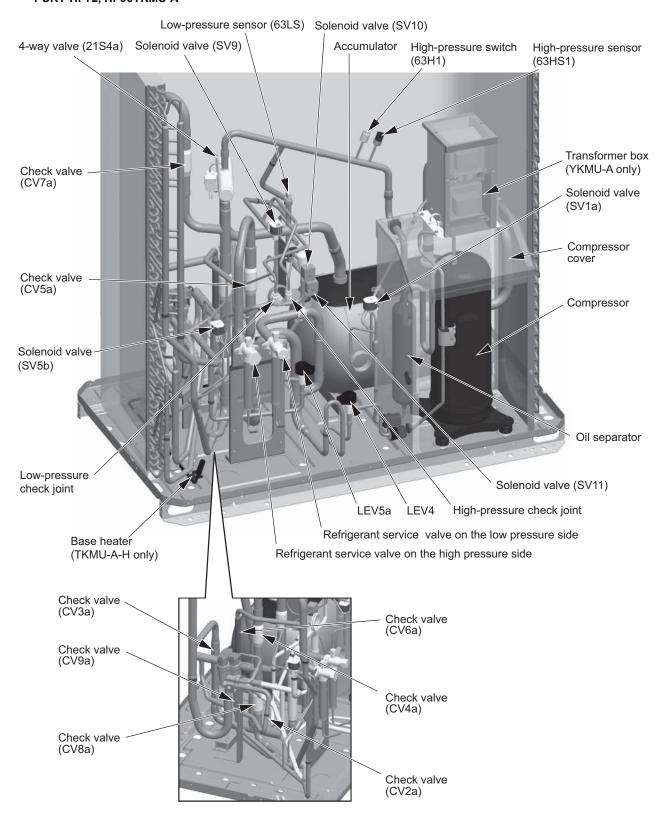
3-1-1 External Appearance of Outdoor Unit

(1) PURY-HP72, HP96TKMU-A-H PURY-HP72, HP96YKMU-A



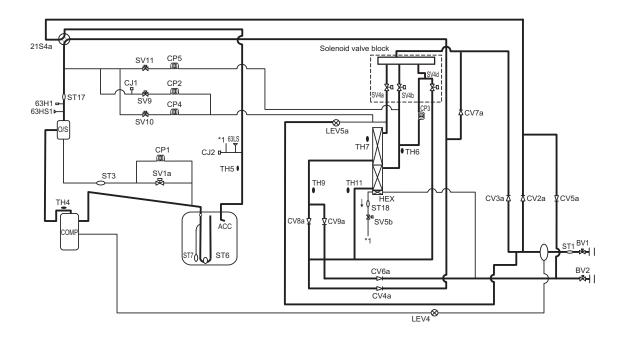
3-1-2 Outdoor Unit Refrigerant Circuits

(1) PURY-HP72, HP96TKMU-A-H PURY-HP72, HP96YKMU-A

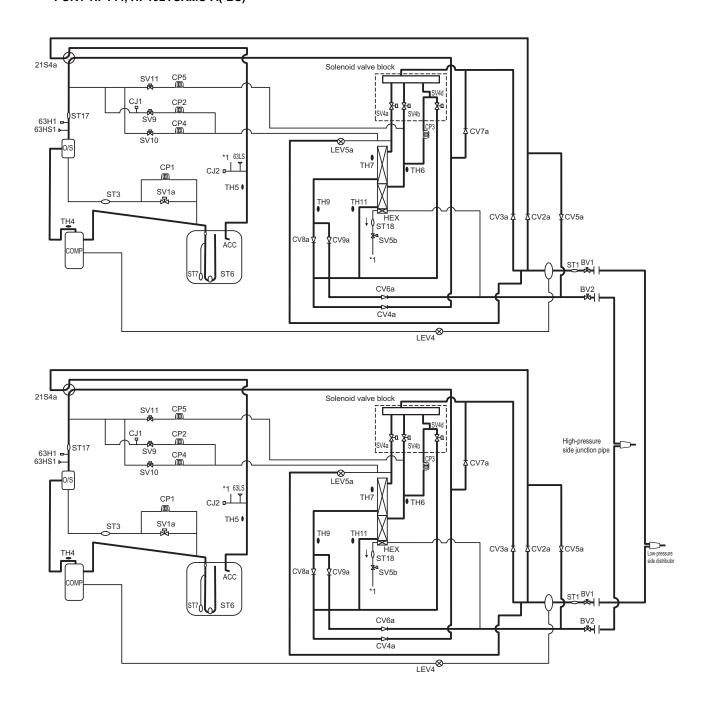


3-2 Outdoor Unit Refrigerant Circuit Diagrams

(1) PURY-HP72, HP96TKMU-A-H(-BS) PURY-HP72, HP96YKMU-A(-BS)



(2) PURY-HP144, HP192TSKMU-A-H(-BS) PURY-HP144, HP192YSKMU-A(-BS)



3-3 Functions of the Major Components of Outdoor Unit

Part name	Symbols (functions)	Notes	Usage	Specifications	Check method
Com- pressor	MC1 (Comp1)		Adjusts the amount of circulating refrigerant by adjusting the operating frequency based on the operating pressure data	HP72, HP96 models Low-pressure shell scroll compressor Wirewound resistance 20°C[68°F]: 0.0920hm (TKMU) 0.3230hm (YKMU)	
High pressure sensor	63HS1		Detects high pressure Regulates frequency and provides high-pressure protection	Connector Pressure 0~4.15 MPa [601psi] Vout 0.5~3.5V 0.717V0.098 MPa [14psi] Pressure [MPa] = 1.38 x Vout [V]-0.69 Pressure [psi] = (1.38 x Vout [V]-0.69) x 145 GND (Black) Vout (White) Vocc (DC5V) (Red)	
Low pressure sensor	63LS		Detects low pressure Provides low-pressure protection	Fressure	
Pres- sure switch	63H1		Detects high pressure Provides high-pressure protection	4.15MPa[601psi] OFF setting	
Power supply trans- former	Trans former	YKMU only	Decreases the power supply voltage (460V) supplied to the circuit board	Primary rated voltage: 460V, 50/60Hz Secondary rated voltage: 229V (No-load voltage)	
Thermis- tor	TH4 (Discharge)		Detects discharge air temper- ature Provides high-pressure pro- tection	Degrees Celsius R ₁₂₀ = 7.465k Ω R _{25/120} = 4057 Rt = 7.465exp{4057($\frac{1}{273+t}$ - $\frac{1}{393}$)}	Resistance check
			0°C[32°F]:698kohm 10°C[50°F]:413kohm 20°C[68°F]:250kohm 30°C[86°F]:160kohm 40°C[104°F]:104kohm 50°C[122°F]:70kohm 60°C[140°F]:48kohm 70°C[158°F]:34kohm 80°C[176°F]:24kohm 90°C[194°F]:17.5kohm 100°C[212°F]:13.0kohm	2/3+t 393"	

Part name	Symbols (functions)	Notes	Usage	Specifications	Check method
Thermis- tor	TH7 (Outdoor tem- perature)		Detects outdoor air temperature Controls fan operation	Degrees Celsius R ₀ = 15k Ω R _{0/80} = 3460 R _t = 15exp{3460 $(\frac{1}{273+t} - \frac{1}{273})$ }	Resistance check
	TH5		Fan operated on the 63LS and TH5 values.	273+t 273	
	TH6		Controls defrosting during heating operation	0°C[32°F] :15kohm 10°C[50°F] :9.7kohm	
	TH9 (Pipe temperature)			20°C[68°F] :6.4kohm 25°C[77°F] :5.3kohm 30°C[86°F] :4.3kohm 40°C[104°F] :3.1kohm	
	TH11 (Pipe temperature)			40 C[104 F] .S. IKOIIII	
	THHS Inverter heat sink tem- perature		Controls inverter cooling fan based on THHS temperature	Degrees Celsius $R_{50} = 17k\Omega$ $R_{25/120} = 4016$ $R_{t} = 17 \exp\{4016 \ (\frac{1}{273 + t} - \frac{1}{323})\}$	
	THBOX Control box internal tem- perature de- tection			0°C[32°F]:161kohm 10°C[50°F]:97kohm 20°C[68°F]:60kohm 25°C[77°F]:48kohm 30°C[86°F]:39kohm 40°C[104°F]:25kohm	
Solenoid valve	SV1a Discharge- suction bypass		High/low pressure bypass at start-up and stopping, and capacity control during low-load operation High-pressure-rise prevention	AC208 - 230V Open while being powered/ closed while not being pow- ered	Continuity check with a tester
	SV4a - SV4d Heat exchanger capacity con- trol		Controls outdoor unit heat exchanger capacity		
	SV5b Heat exchanger capacity con- trol		Prevents high-pressure-rise Controls defrost cycle	AC208 - 230V Closed while being powered/ open while not being pow- ered	
	SV9		High-pressure-rise prevention	AC208 - 230V Open while being powered/ closed while not being pow- ered	
	SV10		ON-defrost control	AC208 - 230V Open while being powered/	
	SV11			closed while not being pow- ered	
LEV	LEV4		Injection amount control	DC12V	Refer to the section
	LEV5a		Evaporating temperature control	Opening of stepping motor driving valve 0-3000 pulses	"Continuity Test with a Tester". Continuity between white and orange. Continuity between yellow, brown, and blue. White MOrange MOrange Pillow Brown Blue

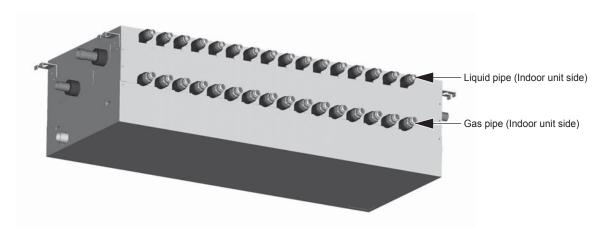
Part name	Symbols (functions)	Notes	Usage	Specifications	Check method
4-way valve	21S4a		Changeover between heating and cooling	AC208-230V Dead: cooling cycle Live: heating cycle	Continuity check with a tester
Fan mo- tor	FAN motor		Regulates the heat exchanger capacity by adjusting the operating frequency and operating the propeller fan based on the operating pressure.	(TKMU) AC200-230V, 920W (YKMU) AC380-460V, 920W	

3-4 Functions of the Major Components of Indoor Unit

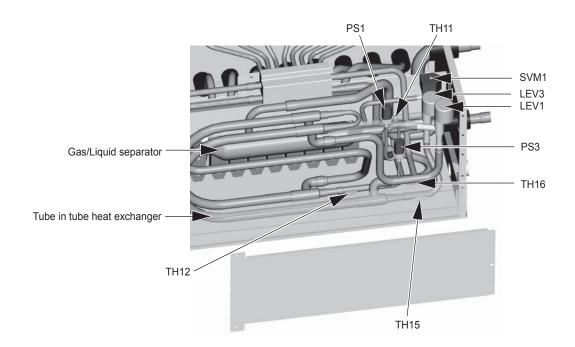
Part Name	Symbol (functions)	Notes	Usage	Specification	Check method
Linear expan- sion valve	LEV		Adjusts superheat at the indoor heat exchanger outlet during cooling Adjusts subcool at the heat exchanger outlet of the indoor unit during cooling	DC12V Opening of stepping motor driving valve 0-(1800) pulses	Refer to the section "Continuity Test with a Tester". Continuity between white, red, and or- ange. Continuity between yellow, brown, and blue. White Red Orange Yellow Brown Blue
Thermis- tor	TH1 (Suction air temperature)		Indoor unit control (Thermo)	R ₀ =15kΩ R ₀ /80=3460 Rt = $\frac{1}{15 \exp{3460(\frac{1}{273+t} - \frac{1}{273})}}$ 0°C [32°F]:15 kΩ 10°C [50°F]:9.7 kΩ 20°C [68°F]:6.4 kΩ 25°C [77°F]:5.3 kΩ 30°C [86°F]:4.3 kΩ 40°C [104°F]:3.1 kΩ	Resistance check
	TH2 (Pipe temperature)		 Indoor unit control (Frost prevention, Hot adjust) LEV control during heating operation (subcool detection). 		
	TH3 (Gas pipe tem- perature)		LEV control during cooling operation (superheat detection)		
	TH4 (Outdoor air temperature)		Indoor unit control (Thermo)		
	Temperature sensor (Indoor air temperature)		Indoor unit control (Thermo)		

3-5 External Appearance and Refrigerant Circuit Components of BC Controller

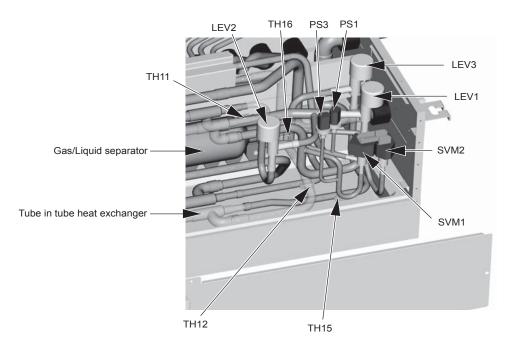
- 1. CMB-P ONU-G, GA, HA
- (1) Front



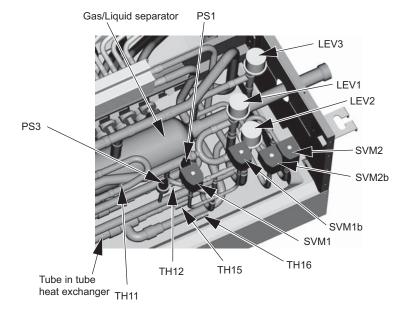
(2) Rear view <G type>



(3) Rear view <GA type>

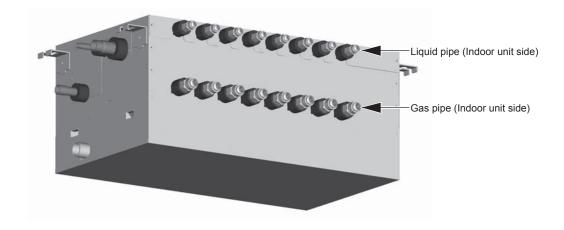


(4) Rear view <HA type>

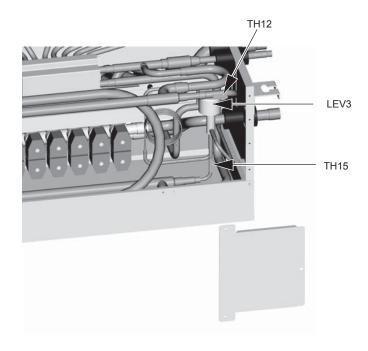


2. CMB-P ONU-GB, HB

(1) Front

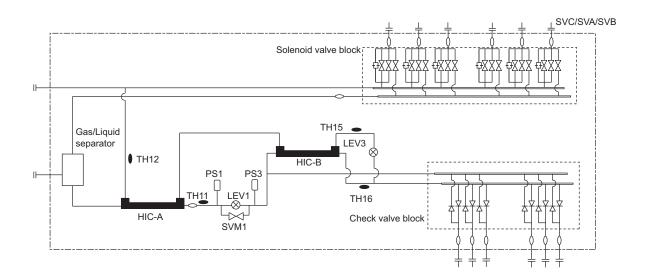


(2) Rear view

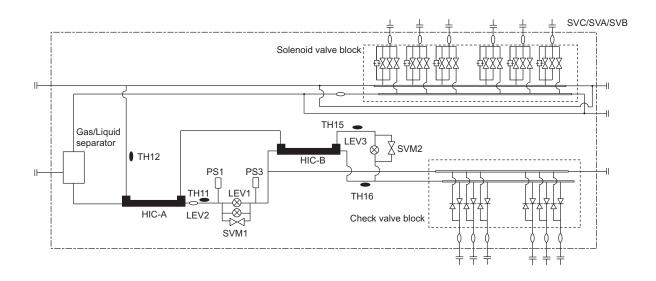


3-6 BC Controller Refrigerant Circuit Diagrams

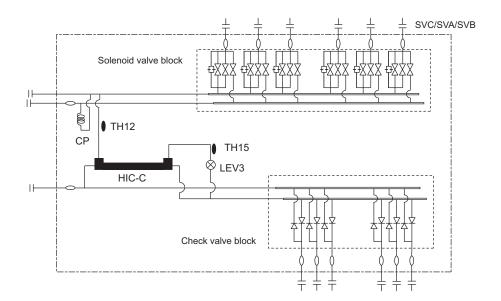
(1) CMB-P104 - P1016NU-G



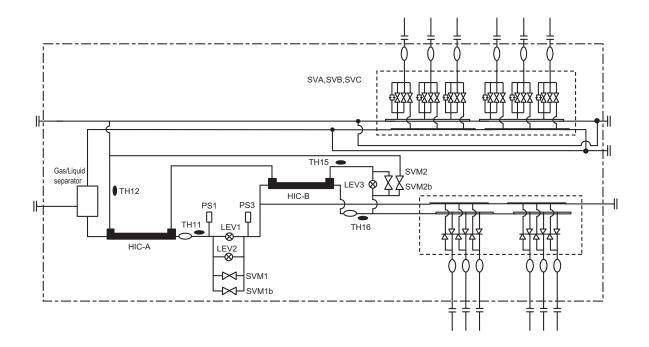
(2) CMB-P108, P1010, P1013, P1016NU-GA (main)



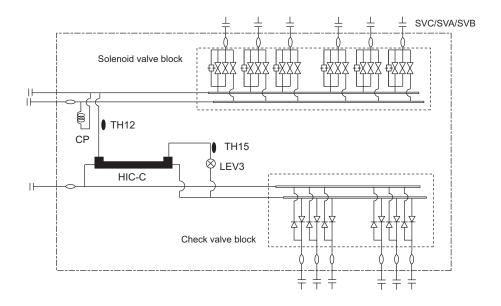
(3) CMB-P104, P108NU-GB (sub)



(4) CMB-P1016V-HA (main)



(5) CMB-P1016NU-HB (sub)



3-7 Functions of the Major Components of BC Controller

(1) G type

Part name	Symbols (functions)	Part code	Usage	Specifications	Check method
Pressure sensor	PS1 (High pressure side)		Detects high pressure LEV control	Pressure 0-4.15 MPa [601psi] Vout 0.5-3.5V 0.071V/0.098 MPa [14psi] Pressure IMPal	
	PS3 (Intermediate pressure)		Detects intermediate pressure LEV control	Connector	
Thermistor	TH11 (Liquid inlet tempera- ture)		LEV control (Liquid level control)	$\begin{array}{l} R_0 &= 15k\Omega \\ R_{0/80} = 3460 \\ R_t = 15 exp\{3460 \; (\frac{1}{273+t} - \frac{1}{273})\} \end{array}$	
	TH12 (Bypass outlet tem- perature)		LEV control (Superheat)	0°C[32°F] : 15kohm 10°C[50°F] :9.7kohm 20°C[68°F] :6.4kohm 25°C[77°F] :5.3kohm	
	TH15 (Bypass in- let tempera- ture)		LEV control (Superheat)	30°C[86°F] :4.3kohm 40°C[104°F] :3.1kohm	
	TH16 (Liquid re- frigerant tempera- ture)		LEV control (Subcool)		
Solenoid valve	SVM1		Opens during cooling and de- frost modes	AC208-230V Open while being powered/	Continuity check with a tester
	SV∎A		Provides refrigerant to indoor unit in cooling operation	closed while not being pow- ered	lester
	SV∎B		Provides refrigerant to indoor unit in heating operation		
	SV■C		Provides refrigerant to indoor unit in cooling operation		
LEV	LEV1		Liquid level control	DC12V	Same as
	LEV3		Pressure differential control	Opening of a valve driven by a stepping motor 0-2000 pulses	indoor LEV

(2) GA type

Part name	Symbols (functions)	Part code	Usage	Specifications	Check method
Pressure sensor	PS1 (High pressure side)		Detects high pressure LEV control	PS1 0~4.15 MPa [601psi] Vout 0.5~3.5V 12.3 0.071V/0.098 MPa [14psi] Pressure [MPa]	
	PS3 (Intermediate pressure)		Detects intermediate pressure LEV control	Connector	
Thermistor	TH11 (Liquid inlet tempera- ture)		LEV control (Liquid level control)	R ₀ = 15kΩ R _{0/80} = 3460 R _t = 15exp{3460 $(\frac{1}{273+t} - \frac{1}{273})$ }	
	TH12 (Bypass outlet tem- perature)		LEV control (Superheat)	0°C[32°F]: 15kohm 10°C[50°F]: 9.7kohm 20°C[68°F]: 6.4kohm 25°C[77°F]: 5.3kohm 30°C[86°F]: 4.3kohm 40°C[104°F]: 3.1kohm	
	TH15 (Bypass in- let tempera- ture)		LEV control (Superheat)		
	TH16 (Liquid re- frigerant tempera- ture)		LEV control (Subcool)		
Solenoid valve	SVM1		Opens during cooling and de- frost modes	AC208-230V Open while being powered/	Continuity check with a
	SVM2		Pressure differential control	closed while not being pow- ered	tester
	SV∎A		Provides refrigerant to indoor unit in cooling operation		
	SV∎B		Provides refrigerant to indoor unit in heating operation		
	SV∎C		Provides refrigerant to indoor unit in cooling operation		
LEV	LEV1 LEV2		Liquid level control Pressure differential control	DC12V Opening of a valve driven by a stepping motor 0-2000 pulses	Same as indoor LEV
	LEV3		Subcool control	u-zuuu puises	

(3) GB type

Part name	Symbols (functions)	Part code	Usage	Specifications	Check method
Thermistor	TH12 (Bypass outlet tem- perature)		LEV control (Superheat)	$R_0 = 15k\Omega$ $R_{0/80} = 3460$ $R_t = 15 \exp\{3460 \left(\frac{1}{273 + t} - \frac{1}{273}\right)\}$	
	TH15 (Bypass in- let tempera- ture)		LEV control (Superheat)	0°C[32°F]: 15kohm 10°C[50°F]: 9.7kohm 20°C[68°F]: 6.4kohm 25°C[77°F]: 5.3kohm 30°C[86°F]: 4.3kohm 40°C[104°F]: 3.1kohm	
Solenoid valve	SV∎A		Provides refrigerant to indoor unit in cooling operation	AC208-230V Open while being powered/ closed while not being pow-	Continuity check with a tester
	SV∎B		Provides refrigerant to indoor unit in heating operation	ered	lestel
	SV∎C		Provides refrigerant to indoor unit in cooling operation		
LEV	LEV3		Pressure differential control	DC12V Opening of a valve driven by a stepping motor 0-2000 pulses	Same as indoor LEV

(4) HA type

Part name	Symbols (functions)	Part code	Usage	Specifications	Check method
Pressure sensor	PS1 (High pressure side)		Detects high pressure LEV control	PS1 Pressure 0-4.15 MPa [601psi]	
	PS3 (Intermediate pressure)		Detects intermediate pressure LEV control	Connector Pressure MPa =1.38 x Vout V -0.99 =1.38 x Vout V -0.99 =(1.38 x Vout V -0.99 x 145	
Thermistor	TH11 (Liquid inlet tempera- ture)		LEV control (Liquid level control)	R ₀ = 15kΩ R _{0/60} = 3460 R _t = 15exp{3460 $(\frac{1}{273+t} - \frac{1}{273})$ }	
	TH12 (Bypass outlet tem- perature)		LEV control (Superheat)	0°C[32°F]: 15kohm 10°C[50°F]: 9.7kohm 20°C[68°F]: 6.4kohm 25°C[77°F]: 5.3kohm 30°C[86°F]: 4.3kohm 40°C[104°F]: 3.1kohm	
	TH15 (Bypass in- let tempera- ture)		LEV control (Superheat)		
	TH16 (Liquid re- frigerant tempera- ture)		LEV control (Subcool)		
Solenoid valve	SVM1		Opens during cooling and de- frost modes	AC208-230V Open while being powered/ closed while not being pow- ered	Continuity check with a
	SVM1b		Opens during cooling and de- frost modes		tester
	SVM2		Pressure differential control		
	SVM2b		Pressure differential control		
	SV∎A		Provides refrigerant to indoor unit in cooling operation		
	SV∎B		Provides refrigerant to indoor unit in heating operation		
	SV■C		Provides refrigerant to indoor unit in cooling operation		
LEV	LEV1 LEV2		Liquid level control Pressure differential control	DC12V Opening of a valve driven by a stepping motor	Same as indoor LEV
	LEV3		Subcool control	0-2000 pulses	

(5) HB type

Part name	Symbols (functions)	Part code	Usage	Specifications	Check method
Thermistor	TH12 (Bypass outlet tem- perature)		LEV control (Superheat)	$R_0 = 15k\Omega$ $R_{0/80} = 3460$ $R_t = 15 \exp{3460 \left(\frac{1}{273 + t} - \frac{1}{273}\right)}$	
	TH15 (Bypass in- let tempera- ture)		LEV control (Superheat)	0°C[32°F]: 15kohm 10°C[50°F]: 9.7kohm 20°C[68°F]: 6.4kohm 25°C[77°F]: 5.3kohm 30°C[86°F]: 4.3kohm 40°C[104°F]: 3.1kohm	
Solenoid valve	SV∎A		Provides refrigerant to indoor unit in cooling operation	AC208-230V Open while being powered/ closed while not being pow-	Continuity check with a tester
	SV∎B		Provides refrigerant to indoor unit in heating operation	ered	lestel
	SV∎C		Provides refrigerant to indoor unit in cooling operation		
LEV	LEV3		Pressure differential control	DC12V Opening of a valve driven by a stepping motor 0-2000 pulses	Same as indoor LEV

Chapter 4 Electrical Components and Wiring Diagrams

4-1	Outdoor Unit Circuit Board Arrangement	87
4-1-1	Outdoor Unit Control Box	87
4-1-2	Transformer Box	89
4-2	Outdoor Unit Circuit Board Components	90
4-2-1	Control Board	90
4-2-2	M-NET Board (Transmission Power Supply Board)	91
4-2-3	INV Board	92
4-2-4	Fan Board	94
4-2-5	Noise Filter	96
4-3	Outdoor Unit Electrical Wiring Diagrams	98
4-4	Transmission Booster Electrical Wiring Diagrams	100
4-5	BC Controller Circuit Board Arrangement	101
4-5-1	BC Controller Control Box	101
4-6	BC Controller Circuit Board Components	102
4-6-1	BC Board	102
4-6-2	Four-Relay Board	103
4-6-3	Ten-Relay Board	103
4-7	BC Controller Electrical Wiring Diagrams	104

4-1 Outdoor Unit Circuit Board Arrangement

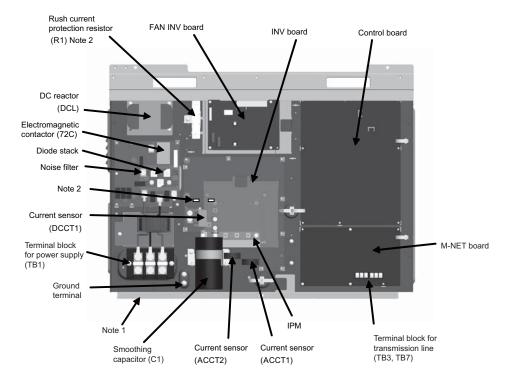
4-1-1 Outdoor Unit Control Box

<HIGH VOLTAGE WARNING>



- · Control box houses high-voltage parts.
- When opening or closing the front panel of the control box, do not let it come into contact with any of the internal components.
- Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and check that the the voltage of the electrolytic capacitor (Inverter main circuit) is 20VDC or below.
 (It takes about 10 minutes to discharge electricity after the power supply is turned off.)

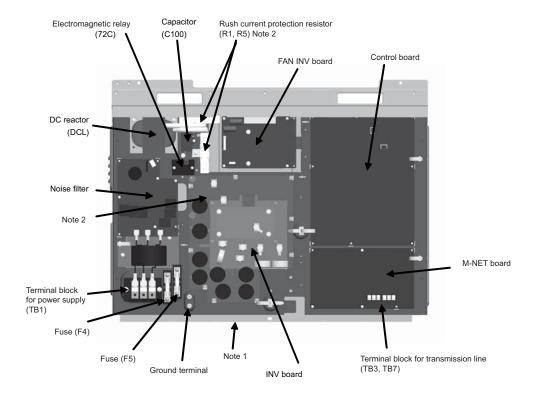
1. PURY-HP72, HP96TKMU-A-H



Note

- 1) Exercise caution not to damage the bottom and the front panel of the control box. Damage to these parts affect the water-proof and dust proof properties of the control box and may result in damage to its internal components.
- 2) Faston terminals have a locking function. Make sure the cable heads are securely locked in place. Press the tab on the terminals to remove them.
- 3) Control box houses high temperature parts. Be well careful even after turning off the power source.
- 4) Disconnect the outdoor unit fan board connector (CNINV) before performing maintenance work. To plug or unplugconnectors, check that the outdoor unit fan is not rotating and that the voltage of capacitor in the main circuit is 20 VDC or below. The capacitor may collect a charge and cause an electric shock when the outdoor unit fan rotates in windy conditions. Refer to the wiring nameplate for details.
- 5) To connect wiring to TB7, check that the voltage is 20 VDC or below.
- 6) Reconnect the connector (CNINV) to the fan board after completion of maintenance work.
- 7) When opening or closing the front panel of the control box, do not let it come into contact with any of the internal components. Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the capacitor voltage (inverter main circuit) has dropped to 20 VDC or less. It takes about 10 minutes to discharge electricity after the power supply is turned off.
- 8) When the power is turned on, the compressor is energized even while it is not operating. Before turning on the power, disconnect all power supply wires from the compressor terminal block, and measure the insulation resistance of the compressor. Check the compressor for a graound fault. If the insulation resistance is 1.0 MΩ or below, connect all power supply wires to the compressor and turn on the power to the outdoor unit. The liquid refrigerant in the compressor will evaporate by energizing the compressor.

2. PURY-HP72, HP96YKMU-A



Note

- 1) Exercise caution not to damage the bottom and the front panel of the control box. Damage to these parts affect the water-proof and dust proof properties of the control box and may result in damage to its internal components.
- 2) Faston terminals have a locking function. Make sure the cable heads are securely locked in place. Press the tab on the terminals to remove them.
- 3) Control box houses high temperature parts. Be well careful even after turning off the power source.
- 4) Disconnect the outdoor unit fan board connector (CNINV) before performing maintenance work. To plug or unplugconnectors, check that the outdoor unit fan is not rotating and that the voltage of capacitor in the main circuit is 20 VDC or below. The capacitor may collect a charge and cause an electric shock when the outdoor unit fan rotates in windy conditions. Refer to the wiring nameplate for details.
- 5) To connect wiring to TB7, check that the voltage is 20VDC or below.
- 6) Reconnect the connector (CNINV) to the fan board after completion of maintenance work.
- 7) When opening or closing the front panel of the control box, do not let it come into contact with any of the internal components. Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the capacitor voltage (inverter main circuit) has dropped to 20 V DC or less. It takes about 10 minutes to discharge electricity after the power supply is turned off.
- 8) When the power is turned on, the compressor is energized even while it is not operating. Before turning on the power, disconnect all power supply wires from the compressor terminal block, and measure the insulation resistance of the compressor. Check the compressor for a graound fault. If the insulation resistance is 1.0 MΩ or below, connect all power supply wires to the compressor and turn on the power to the outdoor unit. The liquid refrigerant in the compressor will evaporate by energizing the compressor.

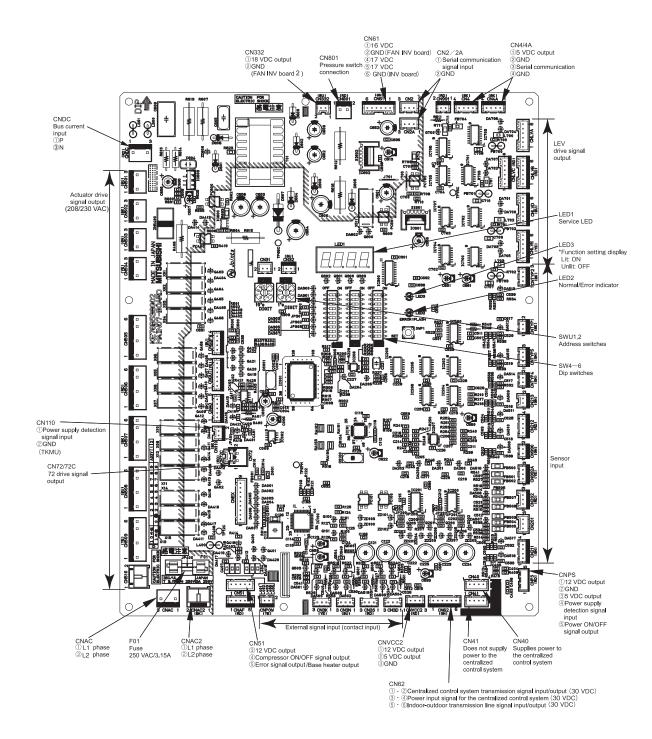
4-1-2 Transformer Box

(1) PURY-HP72, HP96YKMU-A



4-2 Outdoor Unit Circuit Board Components

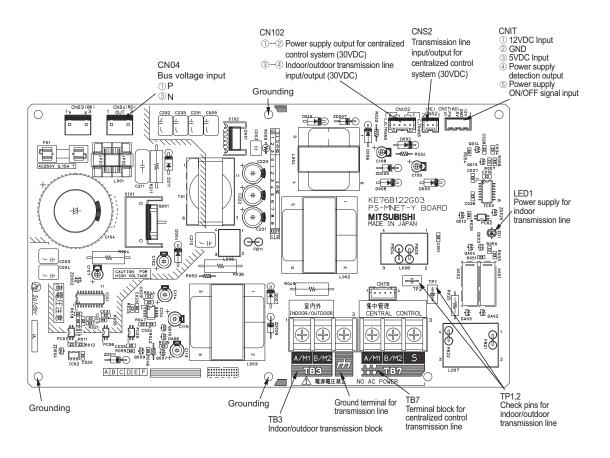
4-2-1 Control Board



^{*}For information about the display of SW4 function settings, refer to the following page(s). [5-1-1 Outdoor Unit Switch Functions and Factory Settings](page 117)

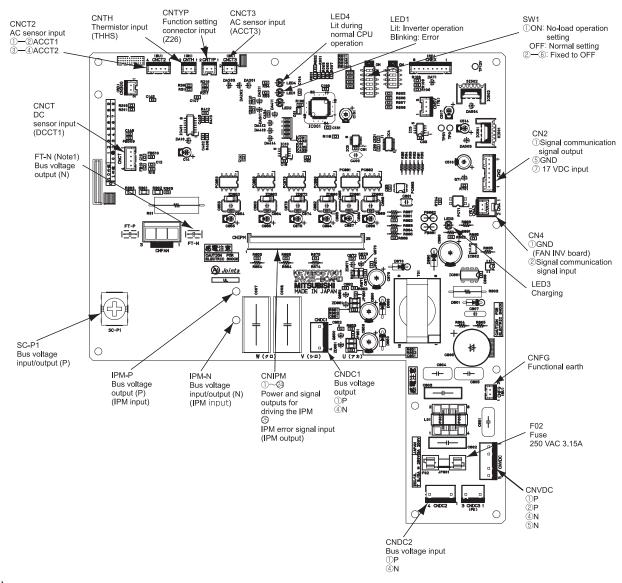
HWE13080 - 90 - GB

4-2-2 M-NET Board (Transmission Power Supply Board)



4-2-3 INV Board

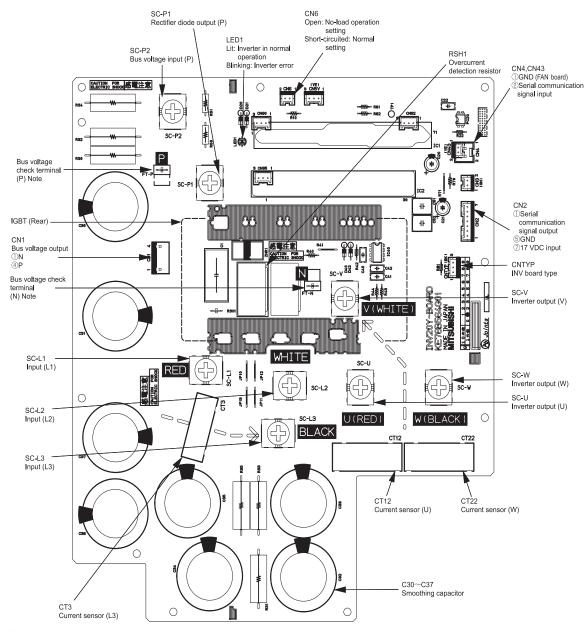
(1) PURY-HP72, HP96TKMU-A-H



Note |

- 1) Faston terminals have a locking function. Make sure the cable heads are securely locked in place. Press the tab on the terminals to remove them.
- When opening or closing the front panel of the control box, do not let it come into contact with any of the internal components. Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the capacitor voltage (inverter main circuit) has dropped to 20 VDC or less. It takes about 10 minutes to discharge electricity after the power supply is turned off.
- 3) Control box houses high temperature parts. Be well careful even after turning off the power source.
- 4) Disconnect the outdoor unit fan board connector (CNINV) before performing maintenance work. To plug or unplug connectors, check that the outdoor unit fan is not rotating and that the voltage of capacitor in the main circuit is 20 VDC or below. The capacitor may collect a charge and cause an electric shock when the outdoor unit fan rotates in windy conditions. Refer to the wiring nameplate for details.
- 5) To connect wiring to TB7, check that the voltage is 20 VDC or below.
- 6) Reconnect the connector (CNINV) to the fan board after completion of maintenance work.
- 7) When the power is turned on, the compressor is energized even while it is not operating. Before turning on the power, disconnect all power supply wires from the compressor terminal block, and measure the insulation resistance of the compressor. Check the compressor for a ground fault. If the insulation resistance is 1.0 MΩ or below, connect all power supply wires to the compressor and turn on the power to the outdoor unit. The liquid refrigerant in the compressor will evaporate by energizing the compressor.

(2) PURY-HP72, HP96YKMU-A

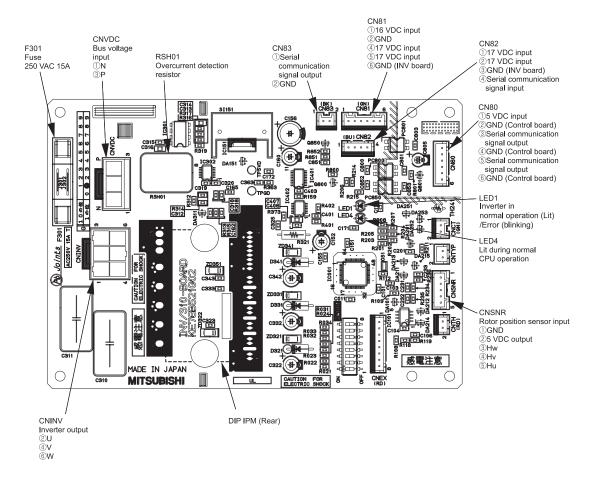


Note |

- 1) When opening or closing the front panel of the control box, do not let it come into contact with any of the internal components. Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the capacitor voltage (inverter main circuit) has dropped to 20 VDC or less. It takes about 10 minutes to discharge electricity after the power supply is turned off.
- Faston terminals have a locking function. Make sure the cable heads are securely locked in place. Press the tab on the terminals to remove them.
- 3) Control box houses high temperature parts. Be well careful even after turning off the power source.
- 4) Disconnect the outdoor unit fan board connector (CNINV) before performing maintenance work. To plug or unplugb connectors, check that the outdoor unit fan is not rotating and that the voltage of capacitor in the main circuit is 20 VDC or below. The capacitor may collect a charge and cause an electric shock when the outdoor unit fan rotates in windy conditions. Refer to the wiring nameplate for details.
- 5) To connect wiring to TB7, check that the voltage is 20 VDC or below.
- 6) Reconnect the connector (CNINV) to the fan board after completion of maintenance work.
- 7) When the power is turned on, the compressor is energized even while it is not operating. Before turning on the power, disconnect all power supply wires from the compressor terminal block, and measure the insulation resistance of the compressor. Check the compressor for a ground fault. If the insulation resistance is 1.0 MΩ or below, connect all power supply wires to the compressor and turn on the power to the outdoor unit. The liquid refrigerant in the compressor will evaporate by energizing the compressor.

4-2-4 Fan Board

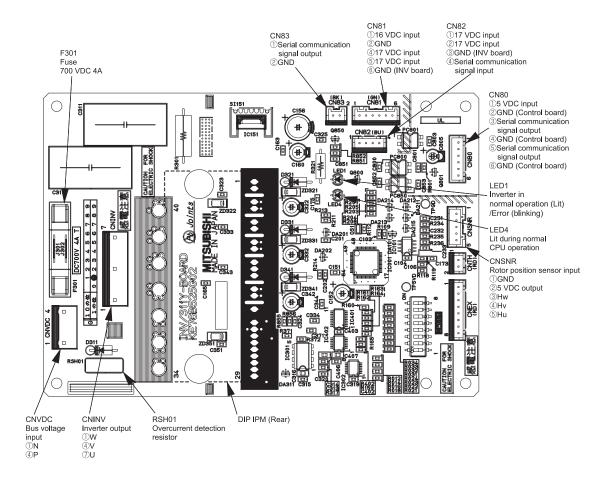
(1) PURY-HP72, HP96TKMU-A-H



Note

- 1) When opening or closing the front panel of the control box, do not let it come into contact with any of the internal components. Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the capacitor voltage (inverter main circuit) has dropped to 20 VDC or less. It takes about 10 minutes to discharge electricity after the power supply is turned off.
- 2) Control box houses high temperature parts. Be well careful even after turning off the power source.
- 3) Disconnect the outdoor unit fan board connector (CNINV) before performing maintenance work. To plug or unplugconnectors, check that the outdoor unit fan is not rotating and that the voltage of capacitor in the main circuit is 20 VDC or below. The capacitor may collect a charge and cause an electric shock when the outdoor unit fan rotates in windy conditions. Refer to the wiring nameplate for details.
- 4) To connect wiring to TB7, check that the voltage is 20 VDC or below.
- 5) Reconnect the connector (CNINV) to the fan board after completion of maintenance work.

(2) PURY-HP72, HP96YKMU-A

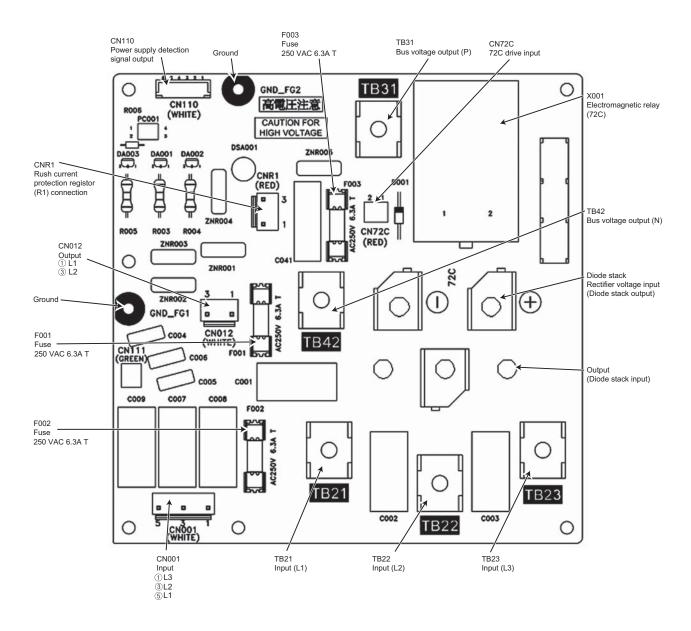


Note

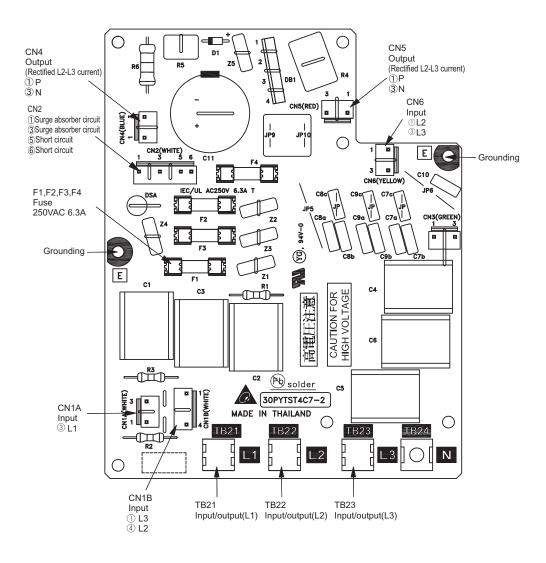
- 1) When opening or closing the front panel of the control box, do not let it come into contact with any of the internal components. Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the capacitor voltage (inverter main circuit) has dropped to 20 VDC or less. It takes about 10 minutes to discharge electricity after the power supply is turned off.
- 2) Control box houses high temperature parts. Be well careful even after turning off the power source.
- 3) Disconnect the outdoor unit fan board connector (CNINV) before performing maintenance work. To plug or unplugconnectors, check that the outdoor unit fan is not rotating and that the voltage of capacitor in the main circuit is 20 VDC or below. The capacitor may collect a charge and cause an electric shock when the outdoor unit fan rotates in windy conditions. Refer to the wiring nameplate for details.
- 4) To connect wiring to TB7, check that the voltage is 20 VDC or below.
- 5) Reconnect the connector (CNINV) to the fan board after completion of maintenance work.

4-2-5 Noise Filter

(1) PURY-HP72, HP96TKMU-A-H

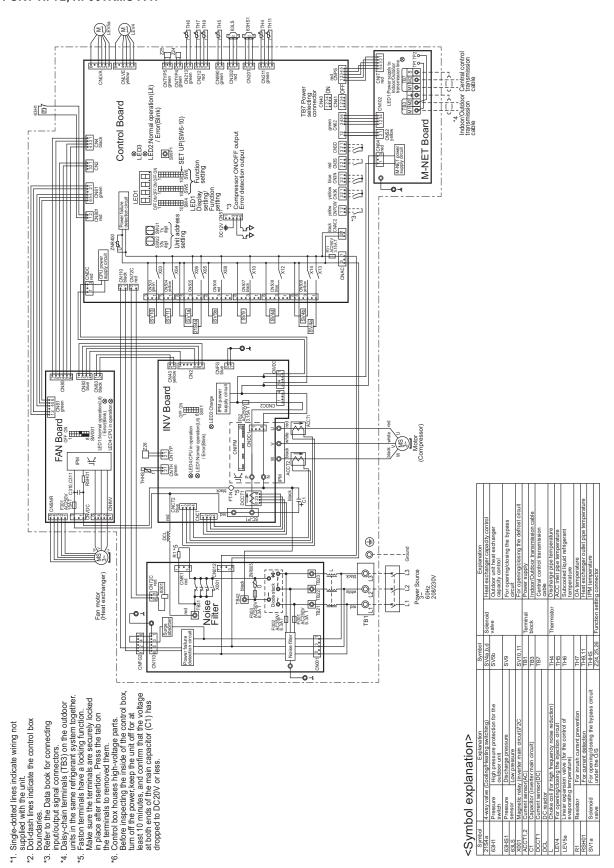


(2) PURY-HP72, HP96YKMU-A

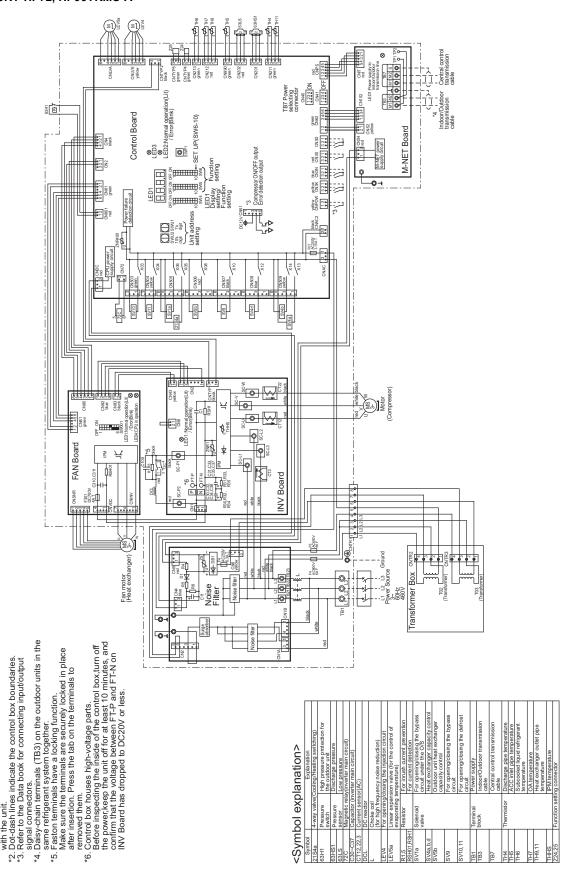


4-3 Outdoor Unit Electrical Wiring Diagrams

(1) PURY-HP72, HP96TKMU-A-H

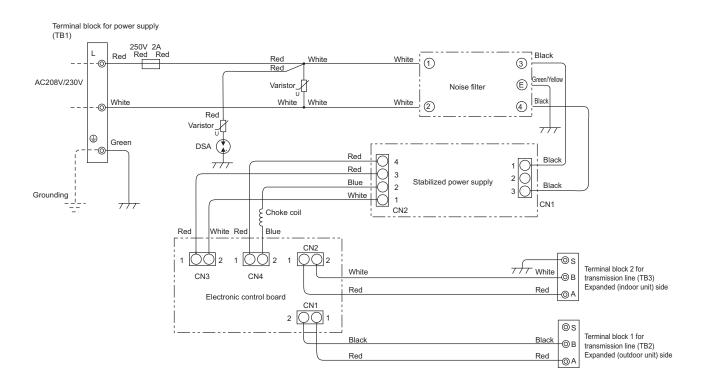


(2) PURY-HP72, HP96YKMU-A



Single-dotted lines indicate wiring not supplied

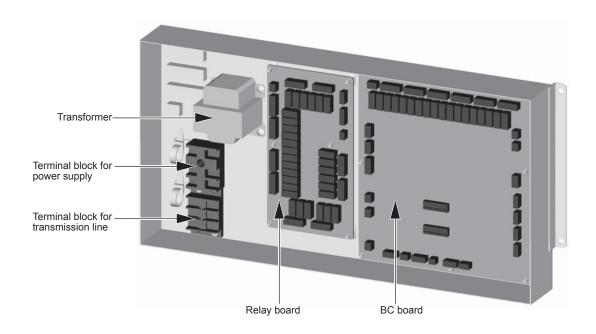
4-4 Transmission Booster Electrical Wiring Diagrams



4-5 BC Controller Circuit Board Arrangement

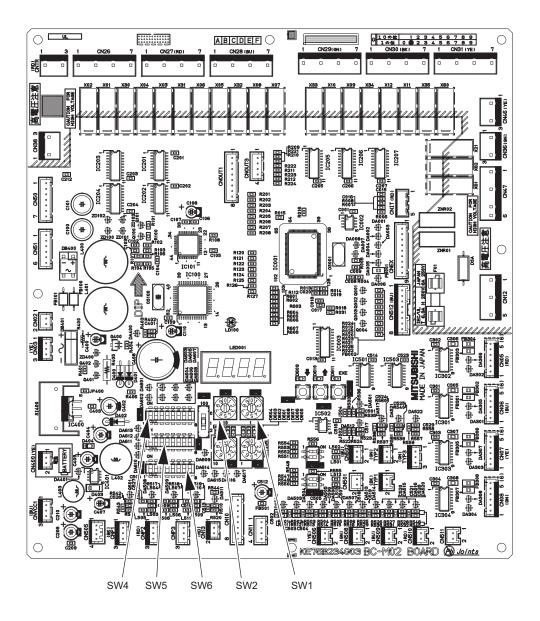
4-5-1 BC Controller Control Box

1. CMB-P1016NU-G, GA, HA

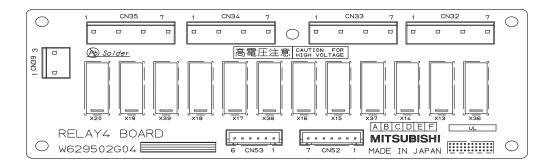


4-6 BC Controller Circuit Board Components

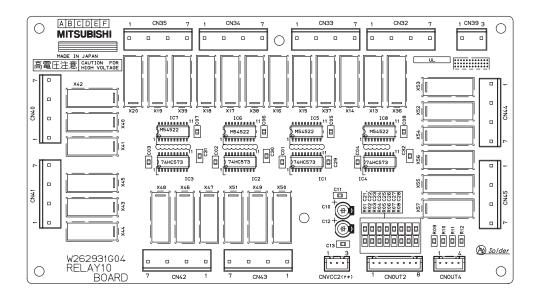
4-6-1 BC Board



4-6-2 Four-Relay Board

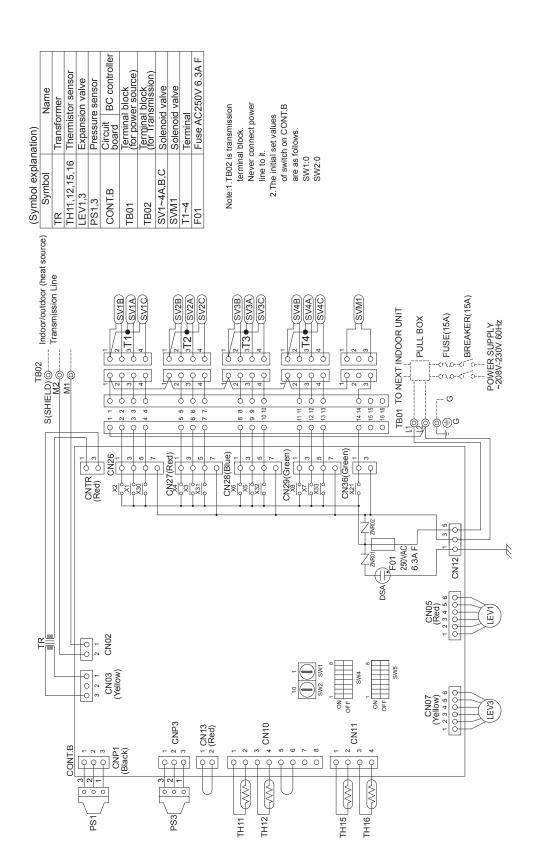


4-6-3 Ten-Relay Board



4-7 BC Controller Electrical Wiring Diagrams

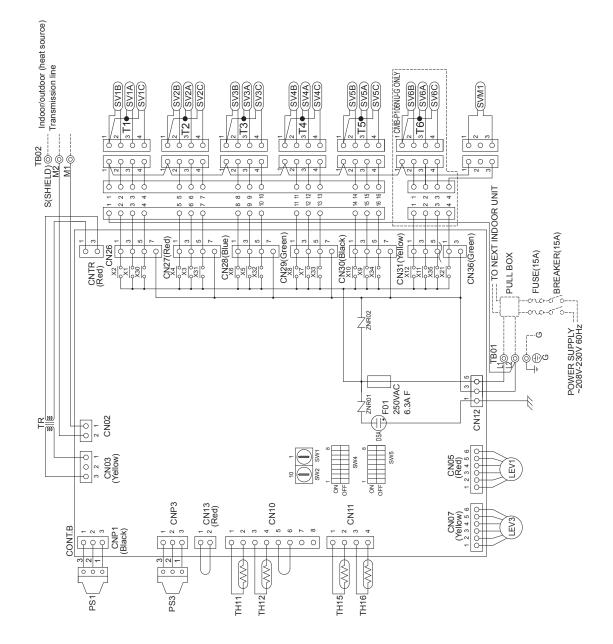
(1) CMB-P104NU-G model



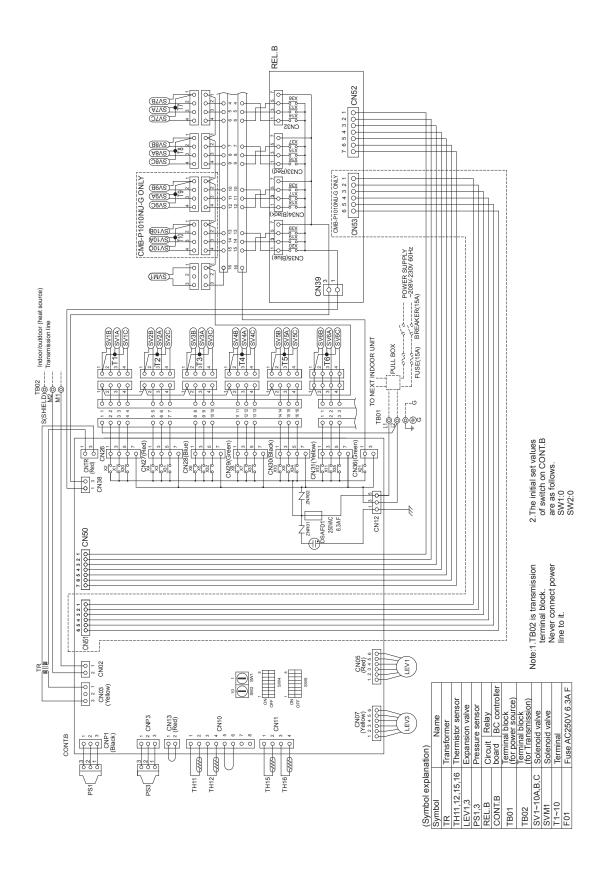
(2) CMB-P105,106NU-G models

(Symbol explanation)	ation)
Symbol	Name
TR	Transformer
TH11,12,15,16	Thermistor sensor
LEV1,3	Expansion valve
PS1,3	Pressure sensor
CONT.B	Circuit BC controller board
TB01	Terminal block (for power source)
TB02	Terminal block (for Transmission)
SV1~6A,B,C	Solenoid valve
SVM1	Solenoid valve
T1~6	Terminal
F01	Fuse AC250V 6.3A F

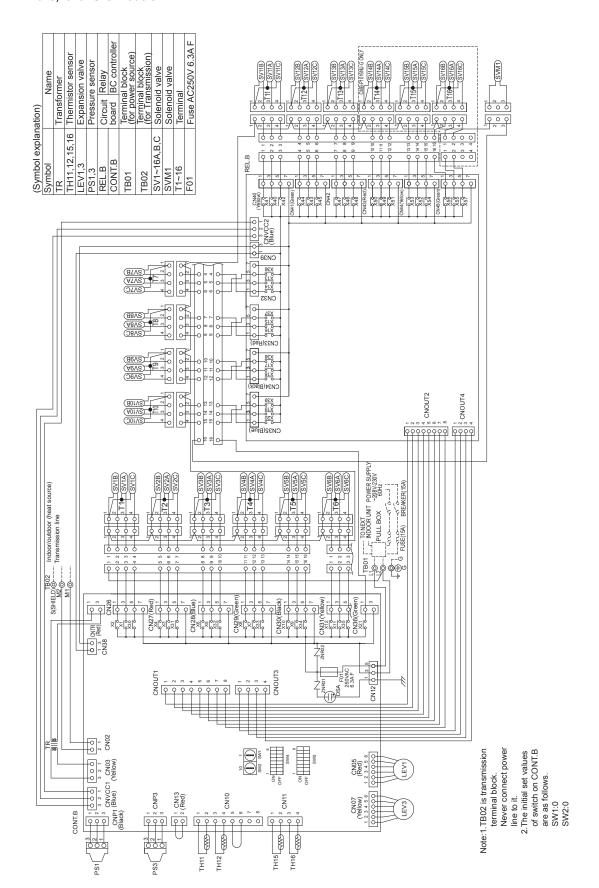
Note:1.TB02 is transmission terminal block.
Never connect power line to it.
2.The initial set values of switch on CONT.B are as follows.
SWV:0
SWV:0



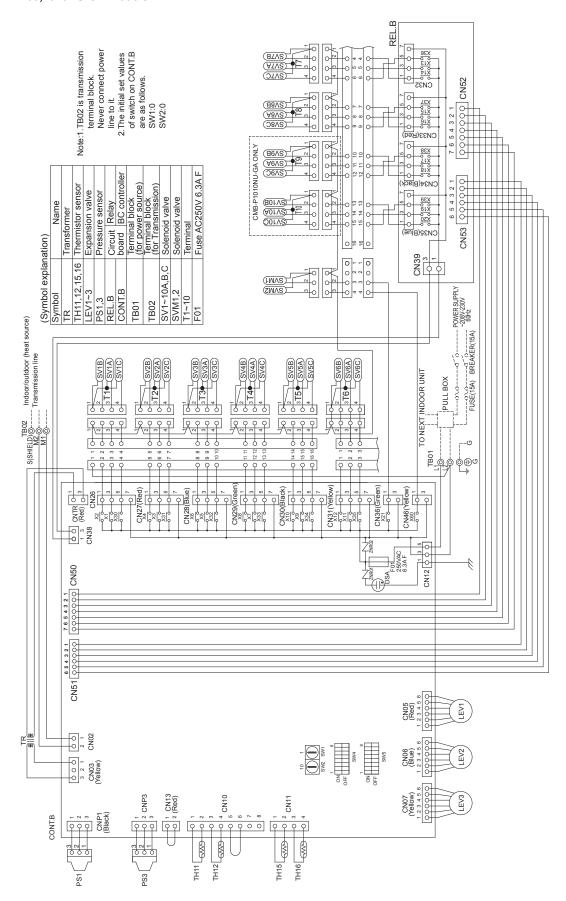
(3) CMB-P108,1010NU-G models



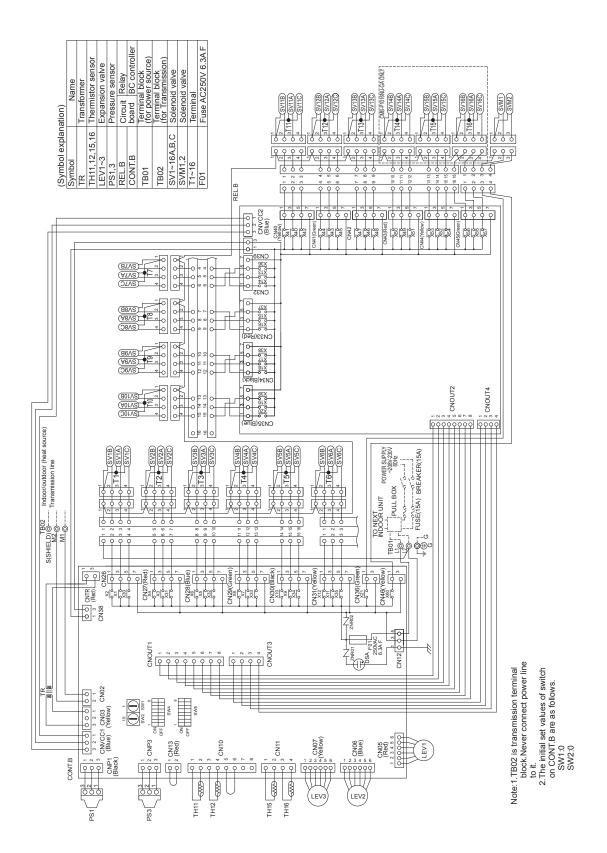
(4) CMB-P1013,1016NU-G models



(5) CMB-P108,1010NU-GA models



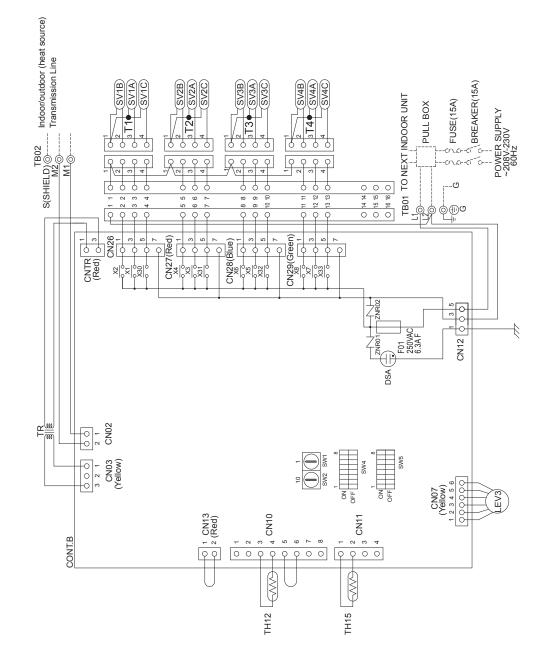
(6) CMB-P1013,1016NU-GA models



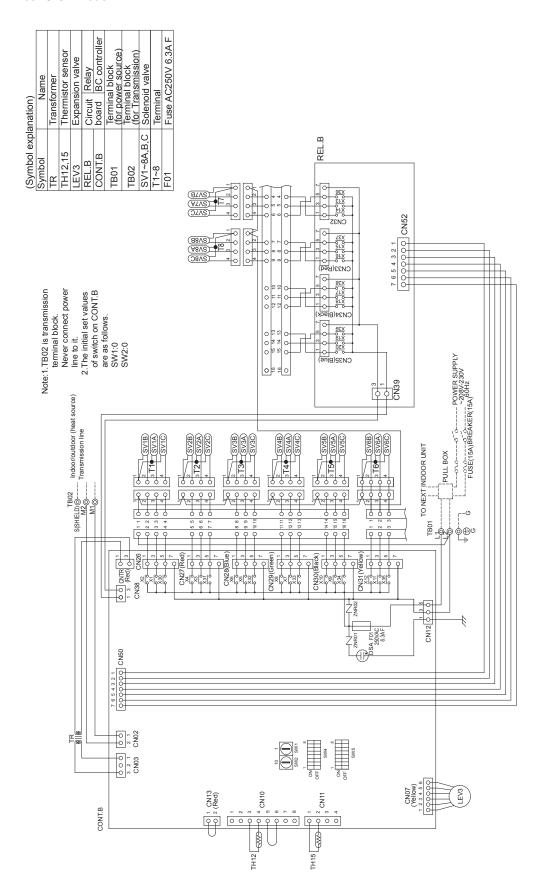
(7) CMB-P104NU-GB model

nation)	Name	Transformer	Thermistor sensor	Expansion valve	Circuit BC controller	Terminal block (for power source)	Terminal block (for Transmission)	Solenoid valve	Terminal	Fuse AC250V 6.3A F
(Symbol explanation)	Symbol	TR	TH12,15	LEV3	CONT.B	TB01	TB02	SV1~4A,B,C	T1~4	F01

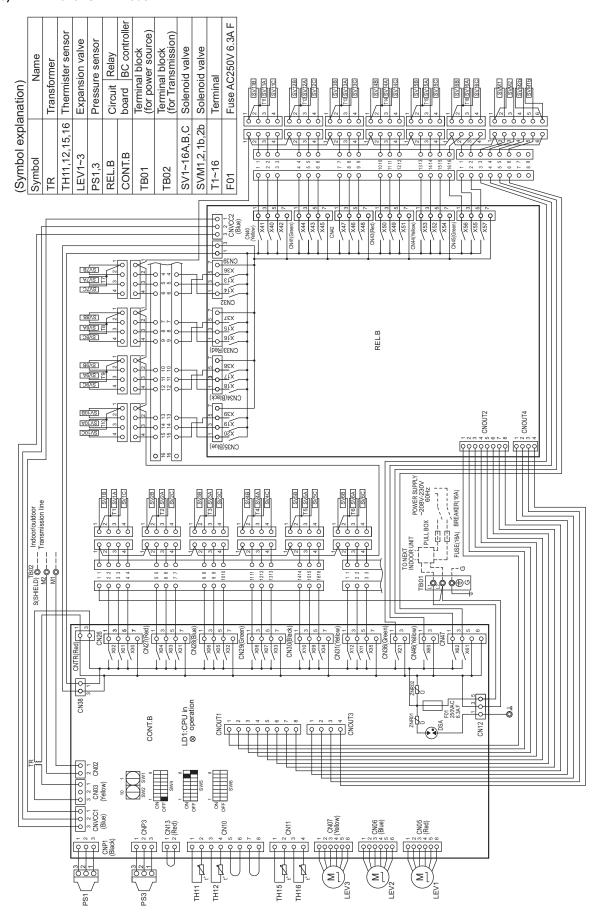
Note:1.TB02 is transmission terminal block.
Never connect power line to it.
2.The initial set values of switch on CONT.B are as follows.
SW1:0
SW2:0
SW2:0



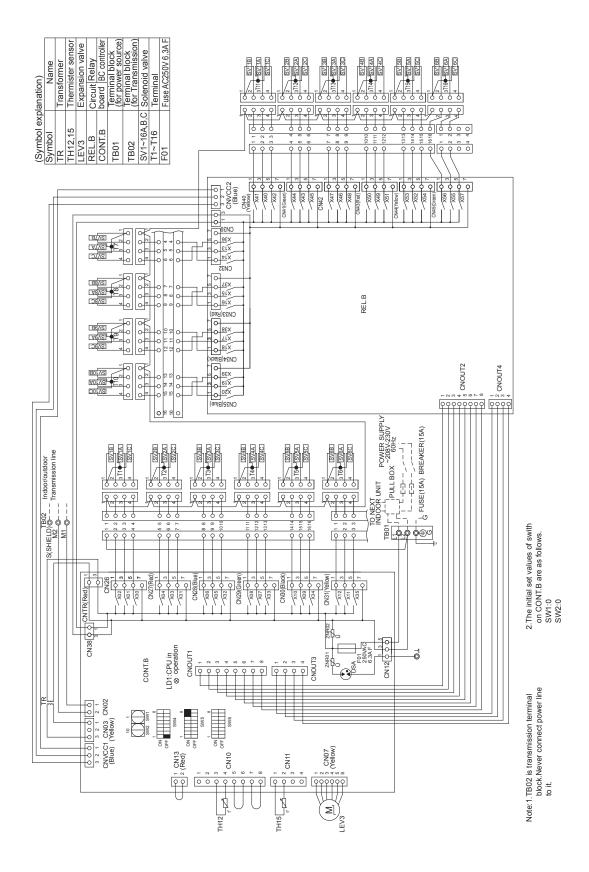
(8) CMB-P108NU-GB model



(9) CMB-P1016NU-HA model



(10) CMB-P1016NU-HB model



Chapter 5 Control

5-1	Dipswitch Functions and Factory Settings	117
5-1-1	Outdoor Unit Switch Functions and Factory Settings	117
5-1-2	Indoor Unit Switch Functions and Factory Settings	121
5-1-3	Remote Controller Switch Functions and Factory Settings	122
5-1-4	BC Controller Switch Settings	123
5-2	Outdoor Unit Control	124
5-2-1	Overview	124
5-2-2	Rotation Control	124
5-2-3	Initial Control	124
5-2-4	Startup Control	124
5-2-5	Refrigerant Bypass Control	125
5-2-6	Frequency Control	126
5-2-7	Defrost Operation Control	127
5-2-8	ON-defrost operation control	129
5-2-9	Refrigerant Recovery Control	129
5-2-10	Oil recovery during compressor operation at low frequency	130
5-2-11	Outdoor Unit Fan Control	130
5-2-12	Compressor discharge superheat control (expansion valve <lev4>)</lev4>	131
5-2-13	Evaporation Temperature Control (Expansion Valves <lev5a>)</lev5a>	131
5-2-14	Control at Initial Startup	131
5-2-15	Emergency Operation Mode	133
5-2-16	Unit Control Scheme	135
5-2-17	Refrigerant Circuits and Refrigerant Cycle Diagrams	136
5-2-18	Operation Mode	137
5-2-19	Demand Control	138
5-3	BC Controller Control	139
5-4	Operation Flowcharts	140
5-4-1	Operation Sequence Flowchart	140
5-4-2	Actions Performed in Different Modes	143

5-1 Dipswitch Functions and Factory Settings

5-1-1 Outdoor Unit Switch Functions and Factory Settings

(1) Control board

Switch		Function	Function according	ng to switch setting	Switch setting timing	Units that require switch setting		
		Tunction	OFF	ON	Switch setting timing	(Note 2)		
SWU	1-2	Unit address set- ting	Set to 00 or 51-100	with the dial switch	Before power on	С		
	1	Centralized control switch	Without connection to the centralized controller	With connection to the centralized controller	Before power on	В		
	2	Deletion of connection information	Normal control	Deletion	Before power on	А		
SW5	3	-				-		
	4	-	-					
	5	-	Preset before shipment -					
	6	-		-				
	7	-	-					
	4	Model setting (out- door unit/high static pressure setting)	Normal static pressure	High static pressure	Before power on	С		
	5	Model setting (out- door unit/high static pressure setting)	High (60 Pa)	High (30 Pa)	Before power on	С		
SW6	7	Performance-prior- ity/low-noise mode setting	Performance-pri- ority mode (Note 3)	Quiet-priority mode	Anytime after power on	A		
	8	Low-noise mode/ step demand switching	Low-noise mode (Note 4)	Step demand mode	Before power on	С		
	10	Self-diagnosis/ function setting No. display setting	Self-diagnosis monitor display	Function setting No. display	Anytime after power on	С		

Note

- 1) Unless otherwise specified, leave the switch to OFF where indicated by "-" or where the cells are blank, which may be set to OFF for a reason.
- 2) A: Only the switch on OC needs to be set for the setting to be effective.
 - B: The switches on both the OC and OS need to be set to the same seeing for the setting to be effective.
 - C: The switches on both the OC and OS need to be set.
- 3) When set to the performance-priority mode, the low-noise mode will be terminated, and the units will operate in the normal mode.
 - Cooling: Ambient temperature or the high pressure is high.
 - Heating: When the outside air temperature is low or when the low pressure is low. Refer to the following page(s). [2-4-7 Various Control Methods Using the Signal Input/Output Connector on Outdoor Unit](page 26)
- Operation noise is reduced by controlling the compressor frequencies and the rotation speed of the outdoor unit fans.
 CN3D needs to be set. Refer to the following page(s). [2-4-7 Various Control Methods Using the Signal Input/Output Connector on Outdoor Unit](page 26)

					Function according	ng to switch setting		Units that require
Switch		Function		OFF (LED3 Unlit)	ON (LED3 Lit)	Switch setting timing	switch setting (Note 2)	
SW4 SW6-10: OFF	1-10 1:ON, 0:O	FF	Self-diagnosis/operation monitor		Refer to the following page(s). [9 LED Status Indicators on the Outdoor Unit Circuit Board](page 325)		Anytime after power on	С
	No.769	1000000011	Test run mode: ON/OFF		Stops all ICs	Sends a test-run sig- nal to all IC	Anytime after power on	А
	No.832	0000001011	Cumulative compressor of tion time deletion	Cumulative compressor operation time deletion		Cleared	Anytime after power on (OFF→ON)	С
	No.848	0000101011	ON-defrost		Ineffective	Effective	Anytime after power on	Α
	No.896 0000000111		Clearance of error his-	ОС	Retained (IC/OC)	Deleted (IC/OC)	Aputime offer power on (OEE LON)	С
			tory	os	Retained (OS)	Deleted (OS)	Anytime after power on (OFF→ON)	C
	No.897	1000000111	High sensible heat operation setting		Normal control	High sensible heat operation mode	After power on and before compressor startup	А
	No.912	0000100111	Pump down function		Normal control	Pump down operation	After being energized and while the compressor is stopped	А
SW4	No.913	1000100111	Forced defrost (Note 3)		Normal control	Forced defrost starts	10 minutes after the completion of defrost operation (OFF→ON) or 10 minutes after compressor start-up (OFF→ON)	D
1-10 [0:OFF, 1:ON] (Note 1)	No.915	1100100111	Defrost start temperature (Note 3)		HP72: -10°C [14°F] HP96: -8°C [18°F]	-5°C [23°F]	Anytime after power on	В
SW6-10:ON	No.916	0010100111	Defrost end temperature (Note 3)		7°C [45°F]	12°C [54°F]	Anytime after power on	В
	No.921	1001100111	Temperature unit display		°C	°F	Anytime after power on	С
	No.922	0101100111	Refrigerant amount adjus	Refrigerant amount adjustment		Refrigerant amount adjust mode	Anytime after power on (except during initial startup/becomes ineffective 60 minutes after compressor started up.	А
	No.932	0010010111	Heating backup		Disabled	Enabled	Anytime after power on	Α
	No.929	1000010111	Haaffaa Qaaaattaa		Depends on the setting	a combination	A. Cara	
	No.935	1110010111	Heating Capacity mode		(Note 7)		Anytime after power on	A
	No.972	0011001111	Automatic cooling/heating mode (IC with the smallest address)		Normal control	Automatic cooling/ heating mode	After power on and before compressor startup	А
	No.974	0111001111	Base heater (Note 8)		Ineffective	Effective	After power on and before compressor startup	В
	No.982	0110101111	Target evaporation temp setting	erature	Refer to Note 4).	•	Anytime after power on	А

Note

To change the settings, set SW6-10 to ON, set SW4, and press and hold SWP01 for 2 seconds or longer (OFF↔ON).

LED3 will light up when the switch setting is ON, and lights off when OFF.

Use the LED3 display to confirm that the settings are properly made.

The settings will need to be set again when the control board is replaced. Write down the settings on the electrical wiring drawing label.

- 2) A: OC: Only the switch on OC needs to be set for the setting to be effective.
 - B: OC: The switches on both the OC and OS need to be set to the same seeing for the setting to be effective.
 - C: OC: The switches on both the OC and OS need to be set.
 - D: OC: The switch on either the OC or OS needs to be set.
- 3) For details, refer to the following page(s).[5-2-7 Defrost Operation Control](page 127)
- 4) The table below shows how the target evaporation temperature is set with SW4 (982).

SW4(982)	\bigcirc OFF \rightarrow ON \rightarrow OFF \rightarrow ON \rightarrow OFF \rightarrow ON
Target evaporating temperature	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

- 5) Unless otherwise specified, leave the switch to OFF where indicated by "-" or where the cells are blank, which may be set to OFF for a reason.
- The settings that are configured with SW4 (SW6-10: ON) will automatically be stored on the indoor units that support the new function*. The stored settings will automatically be restored when the outdoor unit control board is replaced.

If none of the connected indoor units supports the new function, no configuration information will be saved. If this is the case, manually record the settings configuration on the control box panel.

- *The new function is supported on most units that are manufactured in December of 2012 and later. Depending on the model, this function may be
- added on later date. Ask your dealer for further details.

 7) The table below shows the combinations of the settings for items No.929 and No.935 and the Heating Capacity mode setting that corresponds to each combination.

Swi	toh	No.929		
Swi	ton	OFF	ON	
No.935	OFF	Intelligent Heat	Standard	
	ON	High Heat	-	

8) The default settings for the setting item No.974 on the PURY-HP-TKMU-A-H series units is "ON." Set this switch to "OFF" to output error signals. When this switchis set to "OFF," base heaters cannot be used.

(2) INV board

1) PURY-HP72, HP96YKMU-A

Functions are switched with the following connector.

Connector Function		Function according to connector		Setting timing
		Enabled	Disabled	
CN6 short- circuit con- nector	Enabling/disabling the following error detection functions; ACCT sensor failure (5301 Detail No. 115) ACCT sensor circuit failure (5301 Detail No.117) IPM open/ACCT erroneous wiring (5301 Detail No. 119) Detection of ACCT erroneous wiring (5301 Detail No. 120)	Error detection enabled	Error detection disable (No load operation is possible.)	Anytime after power on

Note

- •CN6 short-circuit connector is mated with the mating connector.
- •Leave the short-circuit connector on the mating connector during normal operation to enable error detection and protect the equipment from damage.

2) PURY-HP72, HP96TKMU-A-H

Switch		Function		rding to switch ting	Switch setting timing	
			OFF	ON		
SW1	1	Enabling/disabling the following error detection functions; ACCT/DCCT sensor failure (5301 Detail No. 115, 116) ACCT/DCCT sensor circuit failure (5301 Detail No.117,118) IPM open/Disconnected CNCT2 (5301 Detail No. 119) Detection of erroneous wiring (5301 Detail No.120)	Error detection enabled	Error detection disable (No load operation is possible.)	Anytime after p	ower on
	2	-	-	-	-	-
	3	-	-	-	-	-
	4	-	-	-	-	-
	5	-	-	-	-	-
	6	-	-	-	-	-

Note

- •All are set to OFF at factory shipment. Unless otherwise specified, set the switch to OFF where indicated by "-," which may be set to a certain setting for a reason.
- •Leave SW1-1 to OFF during normal operation. If it is set to ON, errors cannot be detected and the unit may be damaged.

(3) Fan INV board

Switch		Function	set	rding to switch ting	Switch setting timing	
			OFF	ON		
SW1	1	Enabling/Disabling no-load operation No-load operation will continue for approximately 30 seconds, and then the unit will come to an abnormal stop. Refer to the section on "Inverter" for details. [8-10-8 Checking the Fan Inverter for Damage at No Load](page 292) [8-11-8 Checking the Fan Inverter for Damage at No Load](page 302)	No-load oper- ation disabled	No-load oper- ation enabled	Anytime after power on	
	2	-	-	-	-	
	3	-	-	-	-	
	4	-	-	-	-	
	5	Address setting (Control box side)	0	5	Before power on	
	6	-	-	-	-	

Note

- •Only the addresses are preset before shipment (All other switches are set to OFF.) Unless otherwise specified, leave the switch to OFF where indicated by "-," which may be set to OFF for a reason.
 •Set SW1-5 on the fan-box-side fan inverter board to ON (address = 5). Set SW1-6 on the fan-box-side fan inverter board to
- ON (address = 6).

 •Leave SW1-1 to OFF during normal operation. Setting this switch to ON will disable the error detection function and may result
- in equipment damage.

5-1-2 **Indoor Unit Switch Functions and Factory Settings**

(1) Dipswitches

1) SW1,3

Switch		Function	Function accordin	g to switch setting	Switch setting timing	- Notes	
			OFF	ON		Notes	
	1	Room temperature detection position	Indoor unit inlet	Built-in sensor on the remote controller		Set to ON (built-in sensor on the remote controller) on All Fresh (PEFY-VMH-F) model units	
	2	Clogged filter detection	Not available	Available			
	3	Filter check reminder time setting	100h	2500h			
	4	Outside air intake	Disabled	Enabled		Always set to OFF on PKFY-AM model units	
	5	Remote display option	Fan output	Thermo-ON signal			
SW1	6	Humidifier control	During heating operation	Always on while in the heating mode			
	7	Fan speed setting for Heating Thermo-OFF	Very Low	Low			
	7	Forced heating operation at OA temp of 5°C or below	Not available	Available		Applicable to All Fresh model units (PEFY-VMH-F) only	
	8	Fan speed setting for Heating Thermo-OFF	According to the SW1-7 setting	Preset speed			
		-	-	-	While the unit is stopped	Applicable to All Fresh model units (PEFY-VMH-F) only	
	9	Self-recovery after power failure	Disabled	Enabled	(Remote controller OFF)		
	10	Power source start-stop	Disabled	Enabled	, , , , , , , , , , , , , , , , , , ,		
	1	Unit model selection	Heat pump	Cooling only			
	2	Louver	Not available	Available			
	3	Vane	Not available	Available			
	4	Vane swing function	Not available	Available		Always set to OFF on PKFY-VAM model units	
SW3	5	-	-	-			
	6	Vane angle limit setting for cooling operation	Downblow B,C	Horizontal		Always set to Downblow B or C on PKFY-VAM model units	
		Initial vane position	Enabled	Disabled		PLFY-VLMD model only	
	7	Automatic LEV value conversion function	Not available	Available			
	8	Heating 4°C [7.2°F] up	Enabled	Disabled		Set to ON on floor-standing (PFFY) type units	
	9	SHm setting	2°C [3.6°F]	5°C [9°F]		The setting depends on the model and type.	
	10	SCm setting	10°C [18°F] 15°C [27°F]			The setting depends on the model and type.	

Note 1. Settings in the shaded areas are factory settings.(Refer to the table below for the factory setting of the switches whose factory settings are not indicated by the shaded cells.) Note 2. If both SW1-7 and SW1-8 are set to ON, the fan remains stopped during heating Thermo-OFF.

To prevent incorrect temperature detection due to a build-up of warm air around the indoor unit, use the built-in temperature sensor on the remote controller (SW1-1) instead of the one on the indoor unit inlet thermistor.

Note 3. By setting SW3-1, SW1-7, and SW1-8 to a certain configuration, the fan can be set to remain stopped during cooling Thermo-OFF. See the table below for details.

Switch setting			Fan speed duri	ng Thermo-OFF		
SW3-1	SW1-7	SW1-8	Heating	Cooling	Cooling-only/heat pump	
	OFF	OFF	Very Low		Heat pump	
OFF	ON	OFF	Low	Preset speed		
	OFF	ON	Preset speed			
	ON	ON	Stop			
	OFF	055	-	Preset speed	Cooling-only	
ON	ON	OFF	-	i reset speed	Cooling-only	
	OFF	ON	-	Stop		
	ON	ON	Stop	Stop	Heat pump	

Note 4. The settings that are configured from the remote controller will automatically be stored on the outdoor unit. The stored settings will automatically be restored when the indoor unit control board is replaced.

The switch setting may vary depending on the indoor unit's type. Refer to relevant Service Handbook for details.

(2) Address switch

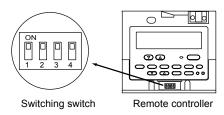
Actual indoor unit address setting varies in different systems. Refer to the installation manual for the outdoor unit for details on how to make the address setting.
Each address is set with a combination of the settings for the 10's digit and 1's digit.

When setting the address to "3", set the 1's digit to 3, and the 10's digit to 0. When setting the address to "25", set the 1's digit to 5, and the 10's digit to 2.

5-1-3 Remote Controller Switch Functions and Factory Settings

(1) MA remote controller (PAR-20MAU)

The SW is located at the bottom of the remote controller under the cover. Operate the switches to perform the remote controller main/sub setting or other function settings. Normally, do not change the settings of switches other than the SW1 (main/sub switching switch). (All the switches are set to "ON" at factory setting.)



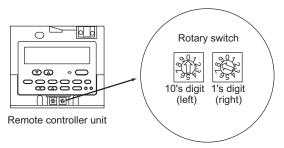
Switch	Function	ON	OFF	Operation by switch settings	Switch setting timing
1	Remote controller main/sub setting	Main	Sub When two remote controllers are connected to one group, set either of the remote controllers to "Sub".		Before power on
2	At power on of the remote controller	Normal startup	Timer mode startup	When the program timer (only few stock products are available) is connected, set to "Timer mode startup" to resume the operation with timer mode after power is restored.	Before power on
3	Cooling/heating display set by automatic setting	Displayed	Not displayed	When the automatic mode is set and the "Cooling"/"Heating" display is not necessary, set to "Not displayed".	Before power on
4	Suction temperature display (discharge temperature display)	Displayed	Not displayed	When the suction temperature (discharge temperature) display is not necessary, set to "Not displayed".	Before power on

Note

The MA remote controller (PAR-21MAAU,PAR-30MAAU) does not have the switches listed above. Refer to the installation manual for the function setting.

(2) ME remote controller (PAR-F27MEA-US)

Set the address of the remote controller with the rotary switch.



Example: In case of address 108

	Address setting range	Setting method
Main remote controller	101-150	Add 100 to the smallest address of all the indoor units in the same group.
Sub remote controller	151-200	Add 150 to the smallest address of all the indoor units in the same group.

Setting of rotary switch		Address No.	
()1-99 ^{*1}	101-199 with the 100's digit automatically being set to 1 ^{*2}	
00		200	

^{*1.} At factory shipment, the rotary switch is set to 01.

Note

To set addresses, use a precision slotted screw driver [2.0 mm [0.08 in] (w)], and do not apply than 19.6N. The use of any other tool or applying too much load may damage the switch.

5-1-4 BC Controller Switch Settings

Switch		Function	Function according	ng to switch setting	Switch setting timing
		FullCuoli	OFF	ON	Switch setting tinning
	1	Model setting	R410A	-	Always leave this switch to OFF.
SW4	2 - 5	-	-	-	-
3004	6	No. of ports	1	2	Before being energized
	7, 8	-	-	-	-
	1 - 6	-	-	-	-
SW5	7	-	-	-	-
	8	-	-	-	-

^{*2.} The address range that can be set with the ME remote controller is between 101 and 200. When the dials are set to a number between 01 and 99, the 100's digit is automatically set to [1]. When the dials are set to 00, the 100's digit is automatically set to [2].

5-2 Outdoor Unit Control

5-2-1 Overview

- •The outdoor units are designated as OC and OS in the order of capacity from large to small (if two or more units have the same capacity, in the order of address from small to large).
- •The setting of outdoor unit can be verified by using the self-diagnosis switch (SW4).

SW4 (SW6-10:OFF)	Display
ON 1 2 3 4 5 6 7 8 9 10	The unit is designated as the OC: "oc" appears on the display. The unit is designated as OS: "oS" appears on the display. For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)

- •The OC determines the operation mode and the control mode, and it also communicates with the indoor units.
- •The OS exercises autonomous distributed control (over defrost, error detection, and actuator control etc.) according to the operation/control mode signals that are sent from the OC.

5-2-2 Rotation Control

- •At the initial startup, outdoor units start up in the order of "OC and OS." When the cumulative operation time of the OC reaches two hours, the OS will start up before the OC at the next start up.
- •Startup sequence rotation is performed while all the indoor units are stopped. (Even after two hours of operation, startup sequence rotation is not performed while the compressor is in operation.)
- In a system with multiple outdoor units (OC and OS), when the integrated operation time of the unit in operation (either OC or OS) reaches one hour during a cooling operation at low outside temperature, that unit will stop and the other unit will go into operation.
- •For information about rotation control at initial startup, refer to the following page(s). [5-2-14 Control at Initial Startup](page 131)
- •Performing startup sequence rotation does not change the basic operation of OC and OS. Only startup sequence is changed.
- *Startup sequence of the outdoor units can be checked with the self-diagnosis switch (SW4) on the OC.

SW4 (SW6-10:OFF)	Display
ON 1 2 3 4 5 6 7 8 9 10	OC→OS: "oc" and the "OC" address appear alternately on the display. OS→OC: "oS" and the "OS" address appear alternately on the display. For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)

5-2-3 Initial Control

- •When the power is turned on, the initial processing of the microcomputer is given top priority.
- •During the initial processing, control processing of the operation signal is suspended. (The control processing is resumed after the initial processing is completed. Initial processing involves data processing in the microcomputer and initial setting of each of the LEV opening. This process will take up to 5 minutes.)
- •During the initial processing, the LED monitor on the outdoor unit's control board displays S/W version → refrigerant type → Model and capacity → and communication address in turn every second.

5-2-4 Startup Control

- •The upper limit of frequency during the first 3 minutes of the operation is 50 Hz.
- •When the power is turned on, normal operation will start after the initial start-up mode (to be described later) has been completed (with a restriction on the frequency).

5-2-5 Refrigerant Bypass Control

Bypass solenoid valves, which bypass the high- and low- pressure sides, perform the following functions.

(1) Bypass solenoid valve (SV1a) (ON = Open)

	SV1a		
Operation	ON	OFF	
When starting-up the compressor of each outdoor unit	ON for 4 minutes.		
After the restoration of thermo or 3 minutes after restart	ON for 4 minutes.		
During cooling or heating operation with the compressor stopped	Always ON. Exception: OFF when 63HS1-63LS is 0.2MPa[29psi] or less		
After the operation has stopped	ON for 3 minutes. Exception: OFF when 63HS1-63LS is 0.2MPa[29psi] or less		
During defrost operation	С	N	
While the compressor is operating at the minimum frequency and when the low pressure (63LS) drops (3 or more minutes after compressor startup)			
When high pressure (63HS1) rises	When 63HS1 exceeds 3.62MPa[525psi]	When 63HS1 is or below 3.43MPa[497psi] and 30 seconds have passed	

(2) Bypass solenoid valve (SV9) (ON = Open)

Operation	SV9		
Operation	ON	OFF	
When high pressure (63HS1) rises during the heating operation	When 63HS1 exceeds 3.50MPa [507psi]	When SV5b is ON and the pressure is 2.70MPa[391psi]or below	
Others	Always OFF		

(3) Bypass solenoid valve (SV5b) (ON = Closed)

Operation	SV5b		
Орегация	ON (Closed)	OFF (Open)	
When high pressure (63HS1) rises during the heating operation	When the pressure is 2.70MPa [391psi] or below	When SV9 is ON and the pressure is 3.50MPa [507psi] or more	
At startup	ON (Closed)		
During defrost cycle	ON (Closed)		
When returning to normal operation after completion of the defrost cycle			
Others	Always ON (Closed)		

5-2-6 Frequency Control

- •Depending on the capacity required, the frequency of the compressor is controlled to keep constant evaporation temperature (0°C [32°F] = 0.71 MPa [103 psi]) during cooling operation, and condensing temperature (49°C [120°F] = 2.88 MPa [418 psi]) during heating operation.
- •The table below summarizes the operating frequency ranges of the inverter compressor during normal operation.
- •The OS in the multiple-outdoor-unit system operates at the actual compressor frequency value that is calculated by the OS based on the preliminary compressor frequency value that the OC determines.

Model	Frequency/cooling		Frequency/heating	
Wiodei	Max	Min	Max	Min
HP72	50Hz	15Hz	103Hz	29Hz
HP96	64Hz	15Hz	120Hz	29Hz

Note

The maximum frequency during heating operation depends on the outside air temperature and the dipswitch settings.

(1) Pressure limit

The upper limit of high pressure (63HS1) is preset, and when it exceeds the upper limit, the frequency is decreased every 15 seconds.

•The actuation pressure is when the high-pressure reading on 63HS1 is 3.58MPa[519psi].

(2) Discharge temperature limit

Discharge temperature (TH4) of the compressor in operation is monitored, and when it exceeds the upper limit, the frequency is decreased every minute.

Operating temperature is 115°C [239°F].

(3) Periodic frequency control

Frequency control other than the ones performed at start-up, upon status change, and for protection is called periodic frequency control (convergent control) and is performed in the following manner.

Periodic control cycle

Periodic control is performed after the following time has passed

- +30 seconds after either compressor start-up or the completion of defrost operation
- •30 seconds after frequency control based on discharge temperature or pressure limit

The amount of frequency change

The amount of frequency change is controlled to approximate the target value based on the evaporation temperature (Te) and condensing temperature (Tc).

5-2-7 Defrost Operation Control

(1) Starting the defrost operation

•The defrost cycle will start when all of the three conditions (outside temperature, cumulative compressor operation time, and pipe temperature) under <Condition 1>, <Condition 2>, or <Condition 3> are met.

	Condition 1	Condition 2	Condition 3
Outside temperature (TH7)	-5°C [23°F] or above	-5°C [23°F] or b	elow
Cumulative compressor operation time 90 minutes or more		50 minutes or more e if the defrost prohibit timer is set to 90.	250 minutes or more
Pipe temperature (TH6) The pipe temperature has stayed below the temperatures in the table below (Note1) for three minutes.		The pipe temperature has stayed below the value obtained from the formula "Outside temperature (TH7) - 5°C [23°F] " for three minutes, or the 63LS reading has stayed below the value obtained from the formula "1.5 + 0.02 × (20+TH7°C) (kgf/cm²) [21.3+0.158×(4+TH7°F) (lb/in²)] " for three minutes.	The pipe temperature has stayed below the temperatures in the table below (Note1) for three minutes

Note |

1) Pipe temperature(TH6)

	HP72	HP96
SW4 (915) OFF	-10°C [14°F]	-8°C [18°F]
SW4 (915) ON	-5°C [23°F]	-5°C [23°F]

- •The defrost cycle will not start if other outdoor units are in the defrost cycle or until a minimum of 10 minutes have passed since the completion of the last defrost cycle.
- •If 10 minutes have passed since compressor startup or since the completion of a defrost cycle, a forced defrost cycle can be started by setting DIP SW4 (913) to ON.
- •Even if the defrost-prohibit timer is set to 90 minutes (or 150 minutes for "Condition 3" to be met), the actual defrost-prohibit time for the next defrost cycle is 50 minutes if the last defrost cycle took 12 minutes.
- •All units in the heating mode will simultaneously go into the defrost cycle in a system with multiple units. The units that are not in operation may or may not go into the defrost cycle, depending on the cumulative operation time of their compressors.

(2) Defrost operation

Outdoou unit	Compressor frequency	Model	Compressor frequency	
		HP72 model	107Hz	
		HP96 model	107Hz	
	Outdoor unit fan	Stopped		
	SV1a	ON (open)		
	SV5b	ON (closed)		
	21S4a	OFF		
SV9		OFF	OFF (closed)	
BC controller	LEV1	G type: 4000, GA type: 6000		
	LEV3	G type: 1000, GA type: 2000 GB, HB type: 60 (full closed)		
	SVM1	ON		
	SVM2	OFF		
	SVM1b	ON		
	SVM2b	OFF		
	SV■B	OFF		
	SV■A	Ports that are connected to the indoor units in cooling Thermo-ON Other ports : OFF		

(3) Stopping the defrost operation

- •The defrost cycle will end when 12 minutes have passed from the beginning of the defrost cycle, OR when the piping temperatures (TH9, TH11, and TH6) have remained above the values listed in the table below for four minutes with SW4 (916) being set to OFF or two minutes with SW4 (916) being set to ON.
- •The defrost cycle will not end for two minutes once started unless one of the following conditions is met: Pipe temperature reaches 25°C [77°F] and SW4 (916) is set to OFF OR α =25+TH7°C [77°F+TH7] and SW4 (916) is set to ON. *1 (5°C [41°F] $\leq \alpha \leq$ 25°C [77°F]).
- In the multiple-outdoor-unit system, defrosting is stopped on all units at the same time.

Model	TH9, TH11, and TH6		
iviodei	SW4 (916) OFF	SW4 (916) ON	
72 model	7°C [45°F]	12°C [54°F]	
96 model	7°C [45°F]	12°C [54°F]	

(4) Problems during defrost operation

•If a problem is detected during defrost operation, the operation will be stopped, and the defrost prohibition time based on the integrated compressor operation time will be set to 20 minutes.

(5) Change in the number of operating indoor units during defrost operation

- •Even when there is a change in the number of operating indoor units during defrost operation, the operation will continue, and an adjustment will be made after the completion of the defrost operation.
- Defrost operation will be continued, even if the indoor units stop or under the Thermo-OFF conditions until it has run its course.

5-2-8 ON-defrost operation control

(1) ON-defrost operation start conditions

- •On-defrost operation will start when all the conditions listed in the table below are met (outside temperature, cumulative compressor operation time, and piping temperature).
- •SW4 (848) must be set to ON to perform ON-defrost operation.

	Single unit	Combination units
Outside temperature (TH7)	3.5°C [38.3°F] - 7.0°C[44.6°F]	
Cumulative compressor operation time	When 30 minutes have passed When 50 minutes have p	
Piping temperature (TH6)	TH6>TH7-8°C [14°F] TH6>TH7-10°C [18°l	

(2) Valve operation during ON-defrost cycle

	Single unit		Combina	tion units
	Top HEX in defrost cycle	Bottom HEX in de- frost cycle	Unit in defrost cycle	Unit in operation
Outdoor unit fan	In operation	In operation	Stopped	In operation
SV1a		O	FF	
SV5b	ON OFF		ON	
SV9	OFF	OFF	OFF	OFF
SV10	ON	OFF	ON	OFF
SV11	OFF	ON	ON	OFF
SV4a	OFF	ON	OFF	ON
SV4b	ON	OFF	OFF	ON
SV4d	OFF	OFF	OFF	OFF
21S4a	ON			

(3) ON-defrost operation end conditions

•ON-defrost operation will end when the ON-defrost operation time in the table below is reached or when the piping temperatures (TH9 and TH11) have remained above the temperature in the table below for three minutes.

	Single unit	Combination units
ON-defrost operation time	When 20 minutes have passed When 30 minutes have passed	
Piping temperature (TH9, TH11)	6°C [43°F]	

5-2-9 Refrigerant Recovery Control

Refrigerant recovery is performed for each BC port during heating operation to prevent the refrigerant from accumulating inside the units that are stopped (in the fan mode), in the cooling mode, or in the heating Thermo-OFF mode. It is also performed during cooling operation to prevent an excessive amount of refrigerant from accumulating in the outdoor heat exchanger.

Starting criteria for the refrigerant recovery cycle (during Cooling-only, Cooling-main, Heating-only, or Heating-main mode)

The refrigerant recovery mode starts when all of the following conditions are met:

 When 5 minutes have passed in the Heating-only or Heating-main mode or 30 seconds have passed in the Cooling-only or Cooling-main mode since the completion of the previous refrigerant recovery cycle AND the when following conditions are met.

TH4 > 105°C [221°F]

2) When the port is not in the 4-minute restart delay mode

Starting criteria for the refrigerant recovery cycle (during Cooling-only, Cooling-main, Heating-only, or Heating-main mode)

- When the port is in the cooling Thermo-OFF, fan, or stop mode SVC at the port turns on for 30 seconds.
- 2) The opening of LEV1 and LEV3 is increased.

5-2-10 Oil recovery during compressor operation at low frequency

- •Oil collection operation is performed after units have been operated continuously for an extended period at the compressor frequency F as listed in the table below (Condition 1). It is performed by fixing the compressor frequency F to the value listed below (Condition 2) for a maximum of four minutes.
- •The opening of the LEV on indoor units will increase during oil collection operation.

	Compressor frequency (F)			
	HP72 HP96			
Condition 1	F < 22	F < 32		
Condition 2	F = 25	F = 36 (Cooling-Only and Cooling-Main) F = 46 (Heating-Only and Heating-Main)		

5-2-11 Outdoor Unit Fan Control

(1) Control method

- •Depending on the capacity required, the rotation speed of the outdoor unit fan is controlled by the inverter to keep a constant condensing temperature of (outside temperature +10°C [50°F]) during cooling operation and a constant evaporation temperature of (0°C [32°F] =0.71 <Pa [103psi]) during heating operation.
- •The OS in the multiple-outdoor-unit system operates at the actual outdoor unit fan control value that is calculated by the OS based on the preliminary outdoor unit fan control value that the OC determines.

(2) Control

- •Outdoor unit fan stops while the compressor is stopped (except in the presence of input from snow sensor).
- •The fan operates at full speed for 5 seconds after start-up.(Only when TH7<0°C [32°F])
- •The outdoor unit fan stops during defrost operation.

(3) Outdoor unit heat exchanger capacity control patterns

Model	Operation mode	Operation patterns	Solenoid valve			
Wiodei			SV4a	SV4b	SV4c	SV4d
HP72, HP96 models	Cooling-only Cooling-main Heating-only Heating-main	1	OFF	ON	-	ON
		2	OFF	ON	-	OFF
		3	ON	ON	-	OFF
		1	ON	ON	-	OFF
		Heating-main	1	ON	ON	-
		2	ON	ON	-	OFF
	Defrost	1	ON	ON	-	OFF

5-2-12 Compressor discharge superheat control (expansion valve <LEV4>)

- •Compressor discharge superheat of OC and OS is controlled separately.
- •Compressor discharge superheat (calculated based on the compressor discharge temperature (TH4) and high pressure (63HS)) is controlled by LEV4 every 30 seconds to stay within the certain target ranges that corresponds to given compressor frequencies.

Compressor frequency	Target compressor discharge superheat
93 Hz or above	20°C [36°F]
83 - 92Hz	25°C [45°F]
72 - 82Hz	30°C [54°F]
71 Hz or below	40°C [72°F]

5-2-13 Evaporation Temperature Control (Expansion Valves <LEV5a>)

(1) LEV5 control will begin when all of the following conditions are met.

- *Units are operated in the Heating-Only or Heating-Main mode.
- •TH7<5°C [41°F]
- +63LS<0.69MPa [99psi]
- •TH15<4°C [39°F]

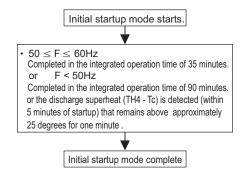
(2) LEV5 control will end when one or more of the following conditions are met.

- •Units are operated in the mode other than Heating-Main or Heating-Only.
- •TH7>10°C [50°F]
- +63LS>0.98MPa [142psi]
- •The LEV is controlled every 30 seconds to maintain constant the bypass inlet temperature of the BC controller during heatingmain mode or heating mode. When LEV5 is being controlled, SV4a, b, and d will all be turned off.
- •The LEV operates at 300 pulse while the compressor is stopped. The LEV opens to a specified position in response to changes in heat exchanger capacity control patterns during cooling only or cooling main mode.

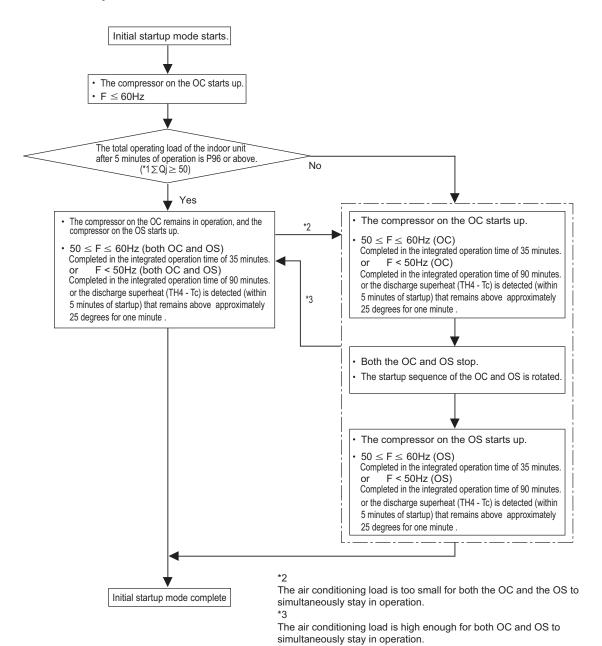
5-2-14 Control at Initial Startup

- •When started up for the first time before 12 hours have elapsed after power on, the unit goes into the initial startup mode.
- •At the completion of the initial operation mode on the OC and OS, they will go into the normal control mode.

(1) Single-outdoor-unit system



(2) Two-outdoor-unit system



*1 ∑Qj:Total capacity (models) code

For information about capacity codes, refer to the following page(s).[5-1-2 Indoor Unit Switch Functions and Factory Settings](page 121)

5-2-15 Emergency Operation Mode

1. Problems with the outdoor unit

- •The HP144 through HP192 models of unit have a mode that allows the outdoor unit to perform an emergency operation when the other outdoor unit in the system malfunctions.
- •This mode can be started by performing an error reset via the remote controller.

(1) Starting the emergency operation

- 1) When an error occurs, the error source and the error code will be displayed on the display on the remote controller.
- 2) The error is reset using the remote controller.
- If an error code appears that permits an emergency operation in step 1) above, (See the table below.), the retry operation starts.
- 4) If the same error is detected during the retry operation (step 3 above), an emergency operation can be started by resetting the error via the remote controller.

Error codes that permit an emergency operation (Applicable to both OC and OS)

Trouble s	ource	Error codes that permit an emergency operation	Error code description	
		0403	Serial communication error	
		4220,4225	Bus voltage drop	
		4230,4235	Heatsink overheat protection	
Compressor Fan motor		4240,4245	Overload protection	
Inverter		4250,4255	Overcurrent relay trip	
		5110	Heatsink temperature sensor failure (THHS)	
		5301	Current sensor/circuit failure	
		5305	Position error	
Thermistor TH4		5104	Discharge temperature sensor failure	
	TH5	5105	Accumulator inlet temperature sensor failure	
	TH6	5106	Subcool heat exchanger liquid outlet sensor failure	
	TH7	5107	Outside air temperature sensor failure	
TH9 TH11		5109	ON-defrost temperature sensor fault	
		5111	ON-defrost temperature sensor fault	
Power	ı	4102	Open phase	
		4115	Power supply sync signal abnormality	

Emergency operation pattern (2 outdoor units)

		OC failure pattern	OS failure pattern
ОС		Trouble	Normal
os		Normal	Trouble
Emergency	Cooling	Permitted	Permitted
operation	Heating	Permitted	Permitted
Maximum total capacity of indoor units (Note 1)		60	0%

Note

1) If an attempt is made to put into operation a group of indoor units whose total capacity exceeds the maximum allowable capacity, some of the indoor units will go into the same condition as Thermo-OFF.

(2) Ending the emergency operation

1) End conditions

When one of the following conditions is met, emergency operation stops, and the unit makes an error stop.

- •When the integrated operation time of compressor in cooling mode has reached four hours.
- •When the integrated operation time of compressor in heating mode has reached two hours.
- •When an error is detected that does not permit the unit to perform an emergency operation.
- 2) Control at or after the completion of emergency operation
 - •At or after the completion of emergency operation, the compressor stops, and the error code reappears on the remote controller.
 - •If another error reset is performed at the completion of an emergency mode, the unit repeats the procedures in section (1) above.
 - •To stop the emergency mode and perform a current-carrying operation after correcting the error, perform a power reset.

2. Communication circuit failure or when some of the outdoor units are turned off

This is a temporary operation mode in which the outdoor unit that is not in trouble operates when communication circuit failure occurs or when some of the outdoor units are turned off.

(1) Starting the emergency operation (When the OC is in trouble)

- 1) When an error occurs, the error source and the error code appear on the display on the remote controller.
- 2) Reset the error via the remote controller to start an emergency operation.

Precautions before servicing the unit

- •When the OC is in trouble, the OS temporarily takes over the OC's function and performs an emergency operation. When this happens, the indoor unit connection information are changed.
- •In a system that has a billing function, a message indicating that the billing system information has an error may appear on the TG-2000A. Even if this message appears, do not change (or set) the refrigerant system information on the TG-2000A. After the completion of an emergency operation, the correct connection information will be restored.

(2) Starting the emergency operation (When the OS is in trouble)

1) A communication error occurs. -> An emergency operation starts in approximately six minutes.

Error codes that permit an emergency operation (Applicable to both OC and OS)

Trouble source	Error codes that permit an emergency operation	Error code description
Circuit board failure or the power	6607	No acknowledgement error
to the outdoor units is off	6608	No response error

Emergency operation pattern (2 outdoor units)

		OC failure pattern	OS failure pattern
OC		Trouble	Normal
os		Normal	Trouble
Emergency	Cooling	Permitted	Permitted
operation	Heating	Permitted	Permitted
Maximum total capacity of indoor units (Note 1)		Capacity the the total cap operable ou	pacity of the

Note |

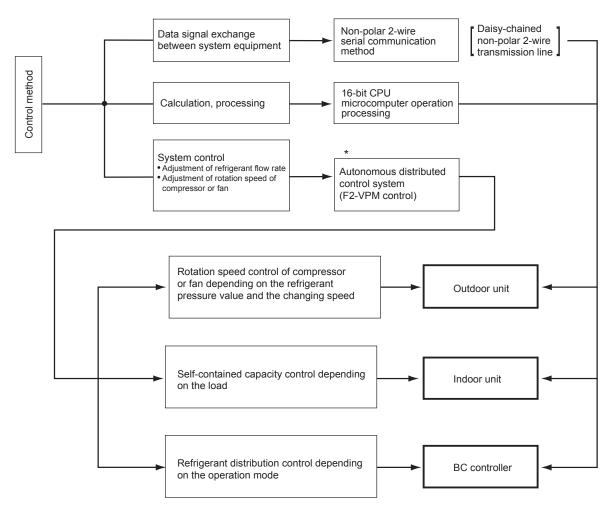
1) If an attempt is made to put into operation a group of indoor units whose total capacity exceeds the maximum allowable capacity, some of the indoor units will go into the same condition as Thermo-OFF.

(3) Ending the emergency operation

When communication is restored, the emergency mode is cancelled, and the units go into the normal operation mode.

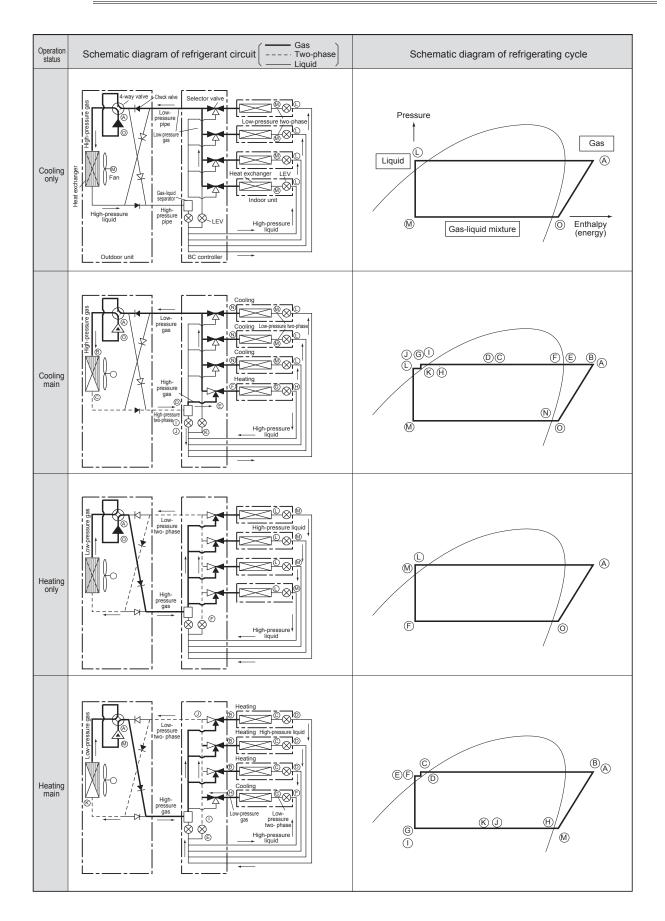
5-2-16 Unit Control Scheme

The control system configuration for the PURY models is shown in the chart below.



Autonomous distributed control system : A system that consists of three independent sub control systems, instead of a single centralized control system, that work together to maintain the overall control of the entire system.

5-2-17 Refrigerant Circuits and Refrigerant Cycle Diagrams



5-2-18 Operation Mode

(1) Indoor unit operation mode

The operation mode can be selected from the following 6 modes using the remote controller.

1	Cooling mode
2	Heating mode
3	Dry mode
4	Automatic cooling/heating mode
5	Fan mode
6	Stopping mode

(2) Outdoor unit operation mode

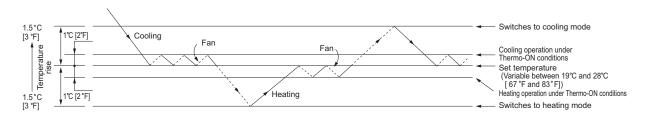
1	Cooling only mode	All indoor units in operation are in cooling mode.
2	Heating only mode	All indoor units in operation are in heating mode.
3	Cooling main mode	Coexistence of units in cooling and heating modes.
4	Heating main mode	Coexistence of units in cooling and heating modes.
5	Stopping mode	All indoor units are in fan mode or stopping mode.

Note

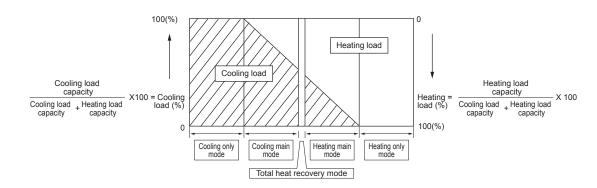
When units in cooing and heating coexist, the operation mode (cooling main mode or heating main mode) will be determined, based on the refrigerant pressure in the R2 refrigerant circuit and speed variation data.

(3) Operation pattern for automatic cooling/heating mode

When the automatic cooling/heating mode is selected from remote controller functions, the indoor temperature will be detected in pattern as shown in the figure below, and the operation mode (cooling or heating) will automatically be selected.



(4) Relationship between the operation mode and the load capacity (kW) (within a system)



5-2-19 Demand Control

Cooling/heating operation can be prohibited (Thermo-OFF) by an external input to the indoor units.

Note

When DIP SW6-8 is set to ON, the 4-step DEMAND control is enabled.
Eight-step demand control is possible in the system with two outdoor units.

For details, refer to the following page(s). [2-4-7 Various Control Methods Using the Signal Input/Output Connector on Outdoor Unit](page 26)

5-3 BC Controller Control

1. Control of SV■A, SV■ B, and SV ■C

SV ■A, SV■ B, and SV ■C turn on or off depending on the operation mode of the branch.

		Mode				
		Cooling	Heating	Stopped	Defrost	
	SV■A	ON	OFF	OFF	OFF	
Port	SV■B	OFF	ON	OFF	OFF	
	SV■C	ON	OFF	OFF	OFF	

2. Control of SVM1, SVM1b

SVM turns on or off depending on the operation mode.

Operation mode	Cooling only	Cooling main	Heating only	Heating main	Defrost	Stopped
SVM1,1b	ON	Pressure dif- ferential con- trol*1	OFF	OFF	ON	OFF

^{*1.} Pressure differential control: The detected differential pressure (PS1 and P3) is controlle every minute so as to be within a certain range.

3. Control of LEV■

LEV ■ opening (sj) is controlled as follows depending on the operation mode.

	Operation mode	Cooling only	Cooling main	Heating only	Heating main	Defrost	Stopped						
	LEV1				*0								
G,GA, HA	LEV2 (only GA,HA type)	2000 Liquid level control*1dif-	Liquid level control*1dif- ferential control*2	control*1dif-	control*1dif-	control*1dif-	control*1dif-	control*1dif-	control*1dif-	110	110 ^{*3}	2000	1200
type	LEV3	Superheat control*4		Pressure dif- ferential con- trol*2	Pressure dif- ferential con- trol*2	G:1000 GA,HA:2000	60						
GB,HB type	LEV3	Superheat control*4	Superheat control*4	60	60	60	60						

^{*1.} Liquid level control: The liquid level detected by the liquid inlet temperature (TH11 sensor) is controlled so as to be within a certain range.

4. Control of SVM2, SVM2b

Operation mode	Cooling only	Cooling main	Heating only	Heating main	Defrost	Stopped
SVM2,2b	OFF	OFF	Pressure differential control*1	Pressure differential control*1	OFF	OFF

^{*1.} Pressure differential control: The detected differential pressure (PS1 and P3) is controlled every minute so as to be within a certain range.

^{*2.} Pressure differential control: The detected differential pressure (PS1 and P3) is controlle every minute so as to be within a certain range.

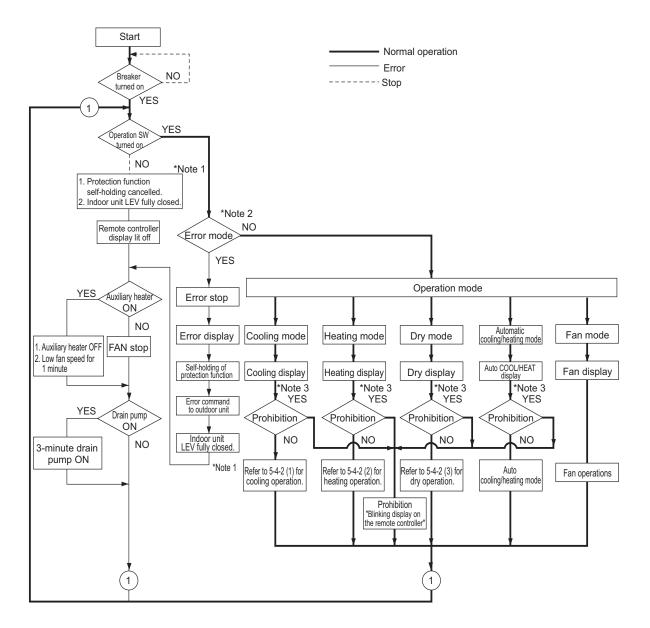
^{*3.} Can be 110 or more due to pressure rise on the liquid side (PS1).

^{*4.} Superheat control: The amound of superheat that is calculated on the bypass inlet and outlet temperature (G, GA,HA:TH12,TH15, GB, HB: TH12, TH15) is controlled every minute so as to be within a certain range.

5-4 Operation Flowcharts

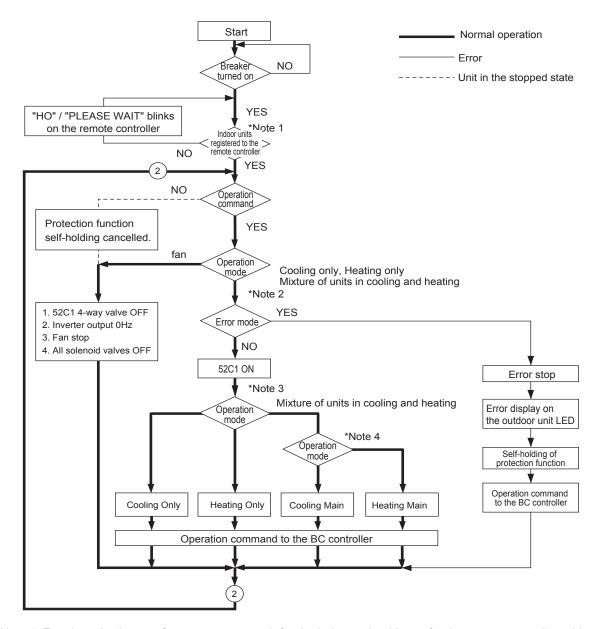
5-4-1 Operation Sequence Flowchart

(1) Indoor unit (cooling, heating, dry, fan mode)



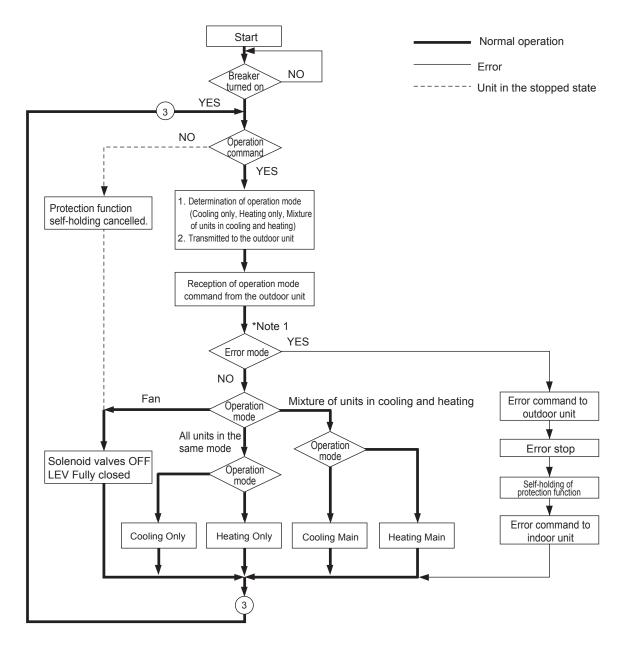
- *Note 1. Indoor unit LEV fully closed : Opening 41.
- *Note 2. The system may go into the error mode on either the indoor unit side or the BC controller or outdoor unit side. If some of the indoor units are experiencing a problem, only those indoor units that are experiencing the problem will stop. If the BC controller or the outdoor unit is experiencing a problem, all the connected units will stop.
- *Note 3. If multiple indoor units are connected to a port and there is a discrepancy in the operation mode between the indoor unit and the port, the operation will be prohibited. (Operation mode blinks on the remote controller, the Fan stops, indoor unit LEV becomes fully closed.)

(2) Outdoor unit (cooling only, heating only, cooling main and heating main modes)



- *Note 1. For about 3 minutes after power on, search for the indoor unit address, for the remote controller address, and for the group information will start. During this, "HO"/ "PLEASE WAIT" blinks on the display of the remote controller. When the indoor unit to be controlled by the remote controller is missing, "HO"/ "PLEASE WAIT" keeps blinking on the display of the remote controller even after 3 or more minutes after power on.
- *Note 2. The system may go into the error mode on either the indoor unit or the outdoor unit side. The outdoor stops only when all of the connected indoor units are experiencing problems. The operation of even a single indoor unit will keep the outdoor unit running. The error will be indicated on the LED display.
- *Note 3. The units will follow the operation mode commands from the BC controller
- *Note 4. When the operation mode commands from the BC controllers are mixed (both cooling and heating), the actual operation mode is determined by the outdoor unit.

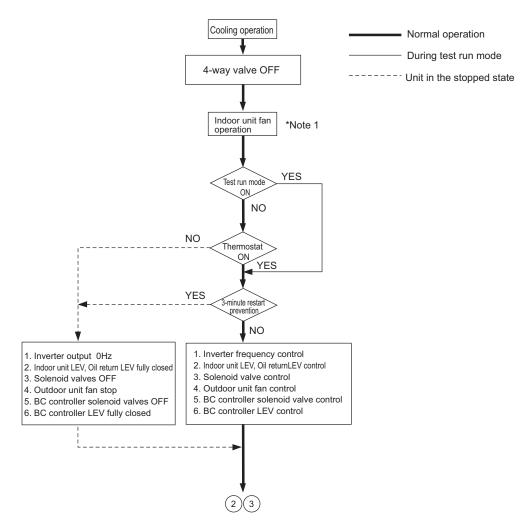
(3) BC controller (cooling only, heating only, cooling main and heating main modes)



Note 1. The system may go into the error mode on either the indoor unit side or the BC controller or outdoor unit side. If some of the indoor units are experiencing a problem, only those indoor units that are experiencing the problem will stop. If the BC controller or the outdoor unit is experiencing a problem, all the connected units will stop.

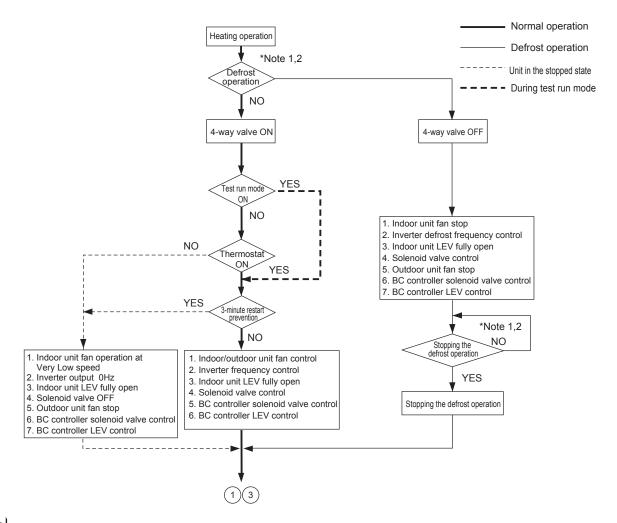
5-4-2 Actions Performed in Different Modes

(1) Cooling operation



*Note 1. The indoor fan operates at the set notch under cooling mode regardless of the ON/OFF state of the thermostat.

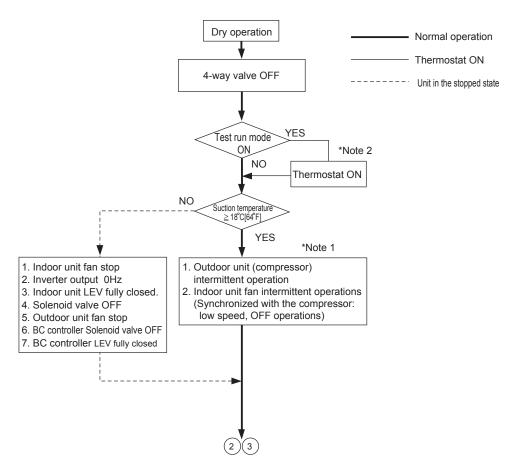
(2) Heating operation



Note

- 1) When the outdoor unit goes into the defrost mode, defrost command is sent to the BC controller and indoor units. Upon reception of the command, the indoor units will go into the defrost mode. When defrosting is completed and upon receiving the signal that indicates the completion of defrosting, indoor units will resume the heating operation.
- Defrost end condition: 10 minutes have passed since defrost operation started.
 Outdoor unit pipe temperature: Refer to the following page(s).[5-2-7 Defrost Operation Control](page 127)

(3) Dry operation



*Note 1.When the indoor unit inlet temperature exceeds 18°C [64°F], the outdoor unit (compressor) and the indoor unit fan start the intermittent operation simultaneously. When the indoor unit inlet temperature becomes 18°C [64°F],or less, the fan always runs (at low speed). The outdoor unit, the indoor unit, and the solenoid valve operate in the same way as they do in the cooling operation when the compressor is turned on.

*Note 2.Thermostat is always kept on during test run mode, and indoor and outdoor unit intermittent operation (ON) time is a little longer than that of normal operation.

Chapter 6 Test Run

6-1	Read before Test Run	149
6-2	MA and ME Remote Controller Functions and Specifications	150
6-2-1	Function/Specification Comparison	150
6-2-2	Local Remote Controller Selection Tips	150
6-3	Making the Group and Interlock Settings from an ME Remote Controller	
6-3-1	Overview	151
6-3-2	Address Registration	151
6-3-3	Address Search	153
6-3-4	Address Deletion	154
6-3-5	Making Group and Interlock Settings from Another Remote Controller	154
6-4	Selecting Remote Controller Functions from an ME Remote Controller	155
6-5	Making Interlock Settings from an MA Remote Controller	157
6-5-1	MA Remote Controller (PAR-21MAAU)	157
6-6	Changing the Room Temperature Detection Position	159
6-7	Test Run Method	160
6-7-1	MA Remote Controller (PAR-21MAAU)	160
6-8	Operation Characteristics and Refrigerant Charge	161
6-9	Evaluating and Adjusting Refrigerant Charge	161
6-9-1	Refrigerant Overcharge and undercharge	161
6-9-2	Checking the Refrigerant Charge during Operation	161
6-9-3	The Amount of Refrigerant to Be Added	162
6-9-4	Refrigerant Charge Adjustment Mode	164
6-10	The Following Symptoms Are Normal	166
6-11	Standard Operation Data (Reference Data)	167
6-11-1	Single Unit (Standard)	167
6-11-2	Dual Unit Combination (Standard)	168

GB

6-1 Read before Test Run

- (1) Check for refrigerant leak and loose cables and connectors.
- (2) When opening or closing the front panel of the control box, do not let it come into contact with any of the internal components.

Note

- *Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the capacitor voltage (inverter main circuit) has dropped to 20 VDC or less. (It takes about 10 minutes to discharge electricity after the power supply is turned off.)
- •Control box houses high temperature parts. Be well careful even after turning off the power source.
- •Perform the service after disconnecting the outdoor unit fan board connector (CNINV) and the inverter board connector (CN1). (To plug or unplugconnectors, check that the outdoor unit fan is not rotating and that the voltage of capacitor in the main circuit is 20 VDC or below. The capacitor may collect a charge and cause an electric shock when the outdoor unit fan rotates in windy conditions. Refer to the wiring nameplate for details.)
- •To connect wiring to TB7, check that the voltage is 20 VDC or below.
- •Reconnect the connector (CNINV) back to the fan board and reconnect the connector (CN1) back to the inverter board after servicing.
- (3) Measure the insulation resistance between the power supply terminal block and the ground with a 500V megger and make sure it reads at least 1.0Mohm.

Note

- *Do not operate the unit if the insulation resistance is below 1.0Mohm.
- *Do not apply megger voltage to the terminal block for transmission line. Doing so will damage the controller board.
- •The insulation resistance between the power supply terminal block and the ground could go down to close to 1Mohm immediately after installation or when the power is kept off for an extended period of time because of the accumulation of refrigerant in the compressor.
- •If insulation resistance reads at least 1 $M\Omega$, by turning on the main power and keeping it on for at least 12 hours, the refrigerant in the compressor will evaporate and the insulation resistance will go up.
- •Do not measure the insulation resistance of the terminal block for transmission line for the unit remote controller.
- (4) When the power is turned on, the compressor is energized even while it is not operating.

Note

- *Before turning on the power, disconnect all power supply wires from the compressor terminal block, and measure the insulation resistance of the compressor.
- •Check the compressor for a ground fault. If the insulation resistance is 1.0 MΩ or below, connect all power supply wires to the compressor and turn on the power to the outdoor unit. (The liquid refrigerant in the compressor will evaporate by energizing the compressor.)
- (5) Make sure the valves on both the high-pressure and low-pressure sides are fully open.

Note

Securely tighten the cap.

(6) Check the phase sequence and the voltage of the power supply.

When the voltage is out of the ±10% range, or when the phase voltage difference is more than 2%, please discuss the countermeasure with the customer.

(7) [When a transmission booster is connected]

Turn on the transmission booster before turning on the outdoor units.

Note

- •If the outdoor units are turned on first, the connection information for the refrigerant circuit may not be properly recognized.
- •In case the outdoor units are turned on before the transmission booster is turned on, perform a power reset on the outdoor units after turning on the power booster.
- (8) Turn on the main power at least 12 hours before test run.

Note |

Insufficient powering time may result in compressor damage.

(9) When a power supply unit is connected to the transmission line for centralized control(*), perform a test run with the power supply unit being energized. Leave the power jumper connector on CN41 as it is (factory setting).

*Includes the cases where power is supplied to the transmission line from a system controller with a power-supply function

6-2 MA and ME Remote Controller Functions and Specifications

There are two types of remote controllers: ME remote controller, which is connected on the indoor-outdoor transmission line, and MA remote controller, which is connected to each indoor unit.

6-2-1 Function/Specification Comparison

Functions/specifications	MA remote controller*1*2	ME remote controller*2*3
Remote controller address settings	Not required	Required
Indoor/outdoor unit address settings	Not required (required only by a system with one outdoor unit)*4	Required
Wiring method	Non-polarized 2-core cable *To perform a group operation, daisy- chain the indoor units using non-polar- ized 2-core cables.	Non-polarized 2-core cable
Remote controller connection	Connectable to any indoor unit in the group	Connectable anywhere on the indoor-out-door transmission line
Interlock with the ventilation unit	Each indoor unit can individually be interlocked with a ventilation unit. (Set up via remote controller in the group.)	Each indoor unit can individually be interlocked with a ventilation unit. (Set up via remote controller.)
Changes to be made upon grouping change	MA remote controller wiring between indoor units requires rewiring.	Either the indoor unit address and remote controller address must both be changed, or the registration information must be changed via MELANS.

^{*1.} MA remote controller refers to MA remote controller (PAR-20MAU, PAR-21MAAU, PAR-30MAAU), Simple MA Remote Controller, and wireless remote controller.

- *3. ME remote controller refers to ME remote controller and Simple ME Remote Controller.
- *4. Depending on the system configuration, some systems with one outdoor unit may require address settings.

6-2-2 Local Remote Controller Selection Tips

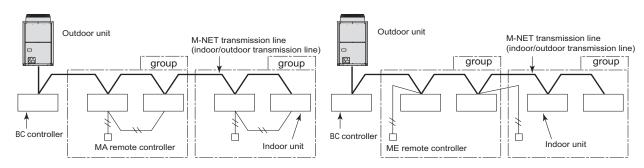
MA remote controller and ME remote controller have different functions and characteristics. Choose the one that better suits the requirements of a given system. Use the following criteria as a reference.

MA remote controller*1*2	ME remote controller*1*2
 There is little likelihood of system expansion and grouping changes. Grouping (floor plan) has been set at the time of installation. 	 There is a likelihood of centralized installation of remote controllers, system expansion, and grouping changes. Grouping (floor plan) has not been set at the time of installation. To connect the remote controller directly to the OA processing unit.

- *1. ME remote controller and MA remote controller cannot both be connected to the same group of indoor units.
- *2. A system controller must be connected to a system to which both MA remote controller and ME remote controller are connected.

<System with MA remote controller>

<System with ME remote controllers>



^{*2.} Either the MA remote controller or the ME remote controller can be connected when a group operation of units in a system with multiple outdoor units is conducted or when a system controller is connected.

6 lest Kun

6-3 Making the Group and Interlock Settings from an ME Remote Controller

6-3-1 Overview

Make the following settings to perform a group operation of units that are connected to different outdoor units or to manually set up the indoor/outdoor unit address.

- (A) Group settings......Registration of the indoor units to be controlled with the remote controller,
 - and search and deletion of registered information.
- (B) Interlock settings......Registration of LOSSNAY units to be interlocked with the indoor units,
 - and search and deletion of registered information

6-3-2 Address Registration

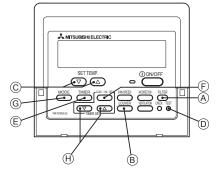
Register the indoor unit to be controlled with the remote controller.

(1) Bring up either one of the following displays on the remote controller:

The blinking display of "HO," which appears when the power is turned on, or the normal display, which appears when the unit is stopped. The display window must look like one of the two figures below to proceed to the next step.







(A) Group Settings

②Bring up the "Group Setting" window.

-Press and hold buttons (a) [FILTER] and (B) [LOUVER] simultaneously for 2 seconds to bring up the display as shown below.



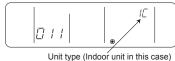
3 Select the unit address.

- Select the address of the indoor unit to be registered by pressing button \bigcirc [SET TEMP. (∇) or (\triangle)] to advance or go back through the addresses.

Register the indoor unit whose address appears on the display.

- Press button (1) [TEST] to register the indoor unit address whose address appears on the display.
- If registration is successfully completed, unit type will appear on the display as shown in the figure below.
- If the selected address does not have a corresponding indoor unit, an error message will appear on the display. Check the address, and try again.

<Successful completion of registration>



<Deletion error>



"BB" blinks to indicate a registration error. (Indicates that selected address does not have a corresponding unit.)

(§) To register the addresses for multiple indoor units, repeat steps (3) and (4) above.



Go to section 6-3-3 "Address Search" for how to search for an address.

(C) To return to the normal display

When all the group settings and interlock settings are made, take the following step to go back to the normal display.

Press and hold buttons (A) [FILTER] and (B) [LOUVER] simultaneously for 2 seconds to go back to the window as shown in step (1).

(B) Interlock Settings

6Bring up the "Interlock Setting" window.

-Press button @[MODE] to bring up the following display. Press again to go back to the "Group Setting" window as shown under step ② .



display window display window

Both the "indoor unit address" and "interlocked unit address" will be displayed together.

Go to section 6-3-3 "Address Search" for how to search for an address.

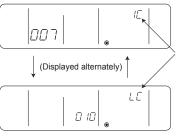
⑦Bring up the address of the indoor unit and the address of the LOSSNAY to be interlocked on the display.

- Select the address of the indoor unit to be registered by pressing button $\widehat{\mathbb{Q}}$ [SET TEMP. (∇) or (\triangle)] to advance or go back through the addresses.
- Select the address of the LOSSNAY unit to be interlocked by pressing button ⊕[TIMER SET (▽) or (△)] to advance or go back through the "interlocked unit addresses."



Make the settings to interlock LOSSNAY units with indoor units

- Press button (i) [TEST] while both the indoor unit address and the address of the LOSSNAY units to be interlocked are displayed to enter the interlock setting.
- Interlock setting can also be made by bringing up the LOSSNAY address in the indoor unit address display window and the indoor unit address in the interlocked unit address display window.



If registration is successfully completed, the two displays as shown on the left will appear alternately.

If the registration fails, "88"

If the registration fails, "88" will blink on the display. (Indicates that the selected address does not have a corresponding unit.)

NOTE: Interlock all the indoor units in the group with the LOSSNAY units; otherwise, the LOSSNAY units will not operate.



To go back to the normal display, follow step (1)

Go to section 6-3-3 "Address Search" for how to search for an address.

6-3-3 Address Search

To search for the address of indoor units that have been entered into the remote controller, follow steps 1 and 2.



(A) To search group settings

11) Bring up the "Group Setting" window.

- Each pressing of button (E) [TIMER] will bring up the address of a registered indoor unit and its unit type on the display.

<Entry found>



Unit type (Indoor unit in this case)

<No entries found>



- When only one unit address is registered, the same address will remain on the display regardless of how many times the button is pressed.
- When the address of multiple units are registered (i.e. "011," "012," "013"), they will be displayed one at a time in an ascending order with each pressing of button [[TIMER] .





To delete an address, go to section 6-3-4 "Address Deletion."

To go back to the normal display, follow step (1)



(B) Interlock setting search

After performing step (6), proceed as follows:

② Bring up the address of the indoor unit to be searched on the display.

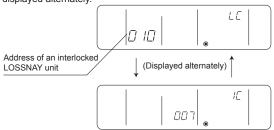
- Select the address of the indoor unit to be searched by pressing button $^{\scriptsize\textcircled{H}}$ [TIMER SET (\bigtriangledown) or (\triangle)] to advance or go back through the interlocked addresses.



LOSSNAY can be searched in the same manner by bringing up the LOSSNAY address in the Interlocked unit address display window.

(3) Bring up on the display the address of the LOSSNAY unit that was interlocked with the indoor unit in step (2).

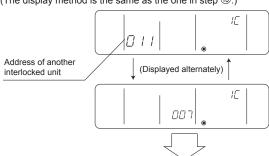
 With each pressing of button © [TIMER], the address of the LOSSNAY and indoor unit that is interlocked with it will be displayed alternately.



Bring up the address of another registered unit on the display.

- After completing step ③, a subsequent pressing of button ⑤[TIMER] will bring up the address of another registered unit

(The display method is the same as the one in step (3).)



Refer to section 6-3-4 "Address Deletion" for how to delete an address.

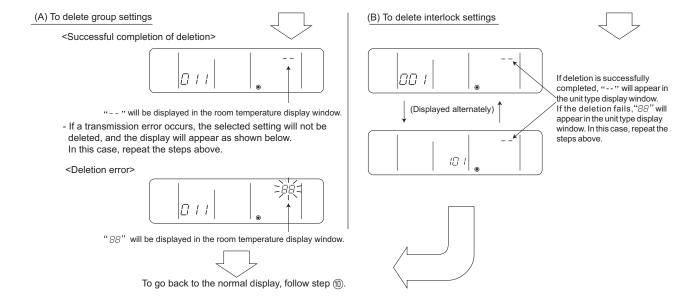
6-3-4 Address Deletion

The addresses of the indoor units that have been entered into the remote controller can be deleted by deleting the group settings.

The interlock settings between units can be deleted by deleting the interlock settings.

Follow the steps in section 6-3-3 "Address Search" to find the address to be deleted and perform deletion with the address being displayed in the display window. To delete an address, the address must first be bought up on the display.

- (5) Delete the registered indoor unit address or the interlock setting between units.
 - Press button € [CLOCK→ON→OFF] twice while either the indoor unit address or the address of the interlocked unit is displayed on the display to delete the interlock setting.



6-3-5 Making Group and Interlock Settings from Another Remote Controller

- (A) Group settings and (B) Interlock settings of a group can be made from any arbitrary remote controller. Refer to "(B) Interlock Settings" under section 6-3-1 "Overview" for operation procedures. Set the address as shown below.
- (A) To make group settings

Interlocked unit address display window...Remote controller address

Indoor unit address display window......The address of the indoor unit to be controlled with the remote controller

(B) To make interlock settings

Interlocked unit address display window...LOSSNAY address

Indoor unit address display window......The address of the indoor unit to be interlocked with the LOSSNAY

6-4 Selecting Remote Controller Functions from an ME Remote Controller

In the remote controller function selection mode, the settings for three types of functions can be made or changed as necessary.

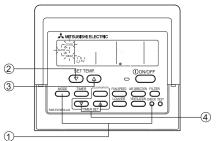
- 1) Operation mode display selection mode (<u>Display or non-display of COOL/HEAT during automatic operation mode</u>)
 When the automatic operation mode is selected, the indoor unit will automatically perform a cooling or heating operation based on the room temperature. In this case, "AUTO COOL" or "AUTO HEAT" will appear on the remote controller display.

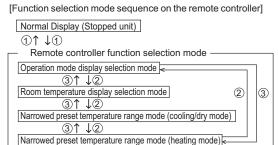
 This setting can be changed so that only "AUTO" will appear on the display.
- 2) Room temperature display selection mode (<u>Display or non-display of room temperature</u>)
 Although the suction temperature is normally displayed on the remote controller, the setting can be changed so that it will not appear on the remote controller.
- remote controller.

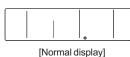
 3) Narrowed preset temperature range mode
 - The default temperature ranges are 67°F to 87°F in the cooling/dry mode and 63°F to 83°F in the heating mode. By changing these ranges (raising the lower limit for the cooling/dry mode and lowering the upper limit for the heating mode), energy can be saved.
 - *The settable range varies depending on the unit to be connected.

NOTE

On the PAR-F27MEA-US model, automatic operation mode cannot be selected while the unit is in the narrowed preset temperature range mode. Only the lower limit can be set for cooling/dry mode, and upper limit for heating mode.







- ①: Press and hold the [CHECK] and [MODE] buttons simultaneously for two seconds.
- ②: [SET TEMP. (▽)] button
- 3: [SET TEMP. (\triangle)] button

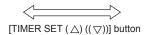
[Operation Procedures]

- 1. Press the [ON/OFF] button on the remote controller to bring the unit to a stop. The display will appear as shown in the previous page (Normal display).
- 2. Press buttons ① [CHECK] and [MODE] simultaneously for 2 seconds to go into the "operation mode display selection mode" under the remote controller function selection mode. Press button ② [SET TEMP. (▽)] or ③ [SET TEMP. (△)] to go into the other three modes under the remote controller function selection mode.

Operation mode display selection mode (Display or non-display of room temperature on the remote controller.)

• "AUTO" "COOL/HEAT" will blink, and either "ON" or "OFF" will light up. Press button - [TIMER SET (\triangle) or (∇)] in this state to switch between "ON" and "OFF."





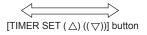


- When it is set to "ON," "AUTO" and "COOL" or "AUTO" and "HEAT" will appear on the display during automatic operation mode.
- When it is set to "OFF," only "AUTO "will appear on the display during automatic operation mode.

Room temperature display selection mode (Display or non-display of room temperature)

• "88 °F" will blink in the room temperature display window, and either "ON "or "OFF" will light up. Press button ④ [TIMER SET (△) or (▽)] in this state to switch between "ON" and "OFF."







- When it is set to "ON," the room temperature will stay in the operation display window during operation.
- When it is set to "OFF," the room temperature will not appear in the operation display window during operation.

Narrowed preset temperature range mode (The range of preset temperature can be changed.)

1) Temperature range setting for the cooling/dry mode

"COOL/DRY" and "LIMIT TEMP." will light up in the display window, and the temperature range for the cooling/dry mode will appear on the display. The lower limit temperature will be blinking in the preset temperature display window. While it is blinking, the temperature setting can be changed. [Selection range for the lower limit temperature]: $67^{\circ}F \iff 87^{\circ}F$ (Medium temperature range indoor unit $57^{\circ}F \iff 87^{\circ}F$) (The upper limit temperature is fixed at $87^{\circ}F$. Only the lower limit temperature is changeable.)



[When the temperature range for the cooling or dry mode is set to 67°F to 87°F]

2) Press button (4) ITIMER SET (\triangle) or (∇)1 to set the lower limit temperature to the desired temperature.



[When the temperature range is changed to 75° F - 87°F]

3) After completing the step above, press button ② [SET TEMP. (▽)] to go into the temperature range setting mode to set the temperature range for the heating operation.

"HEAT" and "LIMIT TEMP" will light up, and the temperature range for the heating mode will appear on the screen.

The upper limit temperature can be changed with button 4 [TIMER SET (\triangle) or (∇)].

[Selection range for the upper limit temperature] : 63°F ←⇒ 83°F (Medium temperature range indoor unit 63°F ←⇒ 83°F)

(The lower limit temperature is fixed at 63°F. Only the upper limit temperature is changeable.)

3. When all the necessary settings have been made, exit the remote controller function selection mode and go back to the Normal display by pressing and holding buttons ① [CHECK] and [MODE] simultaneously for 2 seconds.

6-5 Making Interlock Settings from an MA Remote Controller

LOSSNAY interlock setting (Make this setting only when necessary.)

6-5-1 MA Remote Controller (PAR-21MAAU)

* When the upper controller is connected, make the setting using the upper controller.

NOTE: When using LOSSNAY units in conjunction, interlock the addresses of all indoor units within the group and address of LOSSNAY units.

Perform this operation to enter the interlock setting between the LOSSNAY and the indoor units to which the remote controller is connected, or to search and delete registered information.

In the following example, the address of the indoor unit is 05 and the address of the LOSSNAY unit is 30.

[Operation Procedures]

① Press the ①[ON/OFF] button on the remote controller to bring the unit to a stop.

The display window on the remote controller must look like the figure below to proceed to step ②.

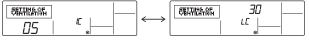


② Press and hold the [FILTER] and [[[] buttons simultaneously for two seconds to perform a search for the LOSSNAY that is interlocked with the indoor unit to which the remote controller is connected.



(3) Search result

- The indoor unit address and the interlocked LOSSNAY address will appear alternately.



<Indoor unit address and indoor unit>

<LOSSNAY address and LOSSNAY>

- Without interlocked LOSSNAY settings



(4) If no settings are necessary, exit the window by pressing and holding the [FILTER] and [=====] buttons simultaneously for 2 seconds. Go to step 1. Registration Procedures to make the interlock settings with LOSSNAY units, or go to step 2. Search Procedures to search for a particular LOSSNAY unit.

Go to step 3. Deletion Procedures to delete any LOSSNAY settings.

< 1. Registration Procedures >

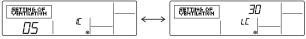
- ⑤ To interlock an indoor unit with a LOSSNAY unit, press the [ﷺETEMP. (♥) or (△)] button on the remote controller that is connected to the indoor unit, and select its address (01 to 50).
- ⓐ Press the [\bigcirc CLOCK (∇) or (\triangle)] button to select the address of the LOSSNAY to be interlocked (01 to 50).



Indoor unit address LOSSNAY address

- Press the [TEST] button to register the address of the selected indoor unit and the interlocked LOSSNAY unit.
 - Registration completed

The registered indoor unit address and "IC," and the interlocked LOSSNAY address and "LC" will appear alternately.



- Registration error

If the registration fails, the indoor unit address and the LOSSNAY address will be displayed alternately.



Registration cannot be completed: The selected unit address does not have a corresponding indoor unit or a LOSSNAY unit. Registration cannot be completed: Another LOSSNAY has already been interlocked with the selected indoor unit.

< 2. Search Procedures >

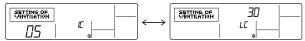
®To search for the LOSSNAY unit that is interlocked with a particular indoor unit, enter the address of the indoor unit into the remote controller that is connected to it.



<Indoor unit address>

- - Search completed (With a LOSSNAY connection)

The indoor unit address and "IC," and the interlocked LOSSNAY address and "LC" will appear alternately.



- Search completed (No interlocked settings with a LOSSNAY exist.)



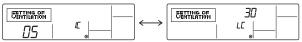
- The selected address does not have a corresponding indoor unit.



< 3. Deletion Procedures >

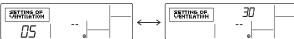
Take the following steps to delete the interlock setting between a LOSSNAY unit and the interlocked indoor unit from the remote controller that is connected to the indoor unit.

(10) Find the address of the LOSSNAY to be deleted (See section 2. Search Procedures.), and bring up the result of the search for both the indoor unit and LOSSNAY on the display.



- ①Press the [② ON/OFF] button twice to delete the address of the LOSSNAY unit that is interlocked with the selected indoor unit.
 - Registration completed

The indoor unit address and "--," and the interlocked LOSSNAY address and "--" will appear alternately.



-Deletion error

If the deletion fails



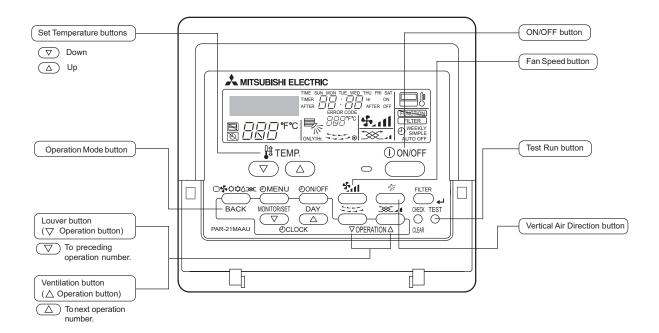
6-6 Changing the Room Temperature Detection Position

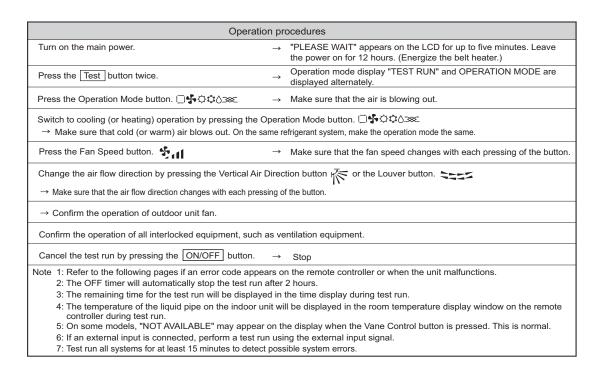
- 1. Selecting the position of temperature detection (Factory setting: SW1-1 on the controller board on the indoor unit is set to OFF.)
 - To use the built-in sensor on the remote controller, set the SW1-1 on the controller board on the indoor unit to ON.
 - •Some models of remote controllers are not equipped with a built-in temperature sensor. Use the built-in temperature sensor on the indoor unit instead.
 - •When using the built-in sensor on the remote controller, install the remote controller where room temperature can be detected.

6-7 Test Run Method

6-7-1 MA Remote Controller (PAR-21MAAU)

The figure shows an MA remote controller (PAR-21MAAU).





6-8 Operation Characteristics and Refrigerant Charge

It is important to have a clear understanding of the characteristics of refrigerant and the operating characteristics of air conditioners before attempting to adjust the refrigerant amount in a given system.

The following table shows items of particular importance.

- 1) During cooling operation, the amount of refrigerant in the accumulator is the smallest when all indoor units are in operation.
- 2) During heating operation, the amount of refrigerant in the accumulator is the largest when all indoor units are in operation.
- 3) General tendency of discharge temperature
 - Discharge temperature tends to rise when the system is short on refrigerant.
 - •Changing the amount of refrigerant in the system while there is refrigerant in the accumulator has little effect on the discharge temperature.
 - •The higher the pressure, the more likely it is for the discharge temperature to rise.
 - •The lower the pressure, the more likely it is for the discharge temperature to rise.
- 4) When the amount of refrigerant in the system is adequate, the compressor shell temperature is 10 to 60°C [18 to 108°F] higher than the low pressure saturation temperature (Te).
 - -> If the temperature difference between the compressor shell temperature and low pressure saturation temperature (Te) is smaller than 5°C [9°F], an overcharging of refrigerant is suspected.

6-9 Evaluating and Adjusting Refrigerant Charge

6-9-1 Refrigerant Overcharge and undercharge

Overcharging or undercharging of refrigerant can cause the following symptoms:

Before attempting to adjust the amount of refrigerant in the system, thoroughly check the operating conditions of the system. Then, adjust the refrigerant amount by running the unit in the refrigerant amount adjust mode.

The system comes to an abnormal stop, displaying 1500 (overcharged refrigerant) on the controller.	Overcharged refrigerant
The operating frequency does not reach the set frequency, and there is a problem with performance.	Insufficient refrigerant amount
The system comes to an abnormal stop, displaying 1102 (abnormal discharge temperature) on the controller.	

6-9-2 Checking the Refrigerant Charge during Operation

Operate all indoor units in either cooling-only or heating-only mode, and check such items as discharge temperature, subcooling, low pressure, suction temperature, and shell bottom temperature to estimate the amount of refrigerant in the system.

Symptoms	Conclusion
Discharge temperature is high. (Normal discharge temperature is below 95°C [203°F].)	Slightly under- charged refrigerant
Low pressure is unusually low.	charged reingerant
Suction superheat is large. (Normal suction superheat is less than 20°C [36°F].)	
Compressor shell bottom temperature is high. (The difference between the compressor shell bottom temperature and low pressure saturation temperature (Te) is greater than 60°C [108°F].)	
Discharge superheat is small. (Normal discharge superheat is greater than 10°C [18°F].)	Slightly overcharged
Compressor shell bottom temperature is low. (The difference between the compressor shell bottom temperature and low pressure saturation temperature (Te) is less than 5°C [9°F].)	refrigerant

6-9-3 The Amount of Refrigerant to Be Added

The amount of refrigerant that is shown in the table below is factory-charged to the outdoor units. The amount necessary for extended pipe (field piping) is not included and must be added on site.

Outdoor unit model	HP72	HP96
Amount of pre-charged refrigerant in the outdoor unit (kg)	11.8	11.8
Amount of pre-charged refrigerant in the outdoor unit [lbs-oz]	26-1	26-1

(1) Calculation formula

The amount of refrigerant to be added depends on the size and the length of field piping. (unit in m[ft])

1) When the piping length from outdoor unit to the farthest indoor unit is 30.5 m [100 ft] or shorter Amount of added refrigerant (kg) = $(0.23 \times L_1) + (0.16 \times L_2) + (0.11 \times L_3) + (0.2 \times L_4) + (0.12 \times L_5) + (0.06 \times L_6) + (0.024 \times L_7) + \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \beta$

Amount of added refrigerant (oz) = $(2.48 \times L_1') + (1.73 \times L_2') + (1.19 \times L_3') + (2.16 \times L_4') + (1.30 \times L_5') + (0.65 \times L_6') + (0.26 \times L_7') + \alpha_1' + \alpha_2' + \alpha_3' + \alpha_4' + \beta'$

2) When the piping length from outdoor unit to the farthest indoor unit is longer than 30.5 m [100 ft] Amount of added refrigerant (kg) = $(0.21 \times L_1) + (0.14 \times L_2) + (0.1 \times L_3) + (0.18 \times L_4) + (0.11 \times L_5) + (0.054 \times L_6) + (0.021 \times L_7) + \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \beta$

Amount of added refrigerant (oz) = $(2.26x L_1') + (1.51 x L_2') + (1.08x L_3') + (1.94 x L_4') + (1.19 x L_5') + (0.59 x L_6') + (0.23 x L_7') + <math>\alpha_1' + \alpha_2' + \alpha_3' + \alpha_4' + \beta'$

 $L_1\,$: Length of ø22.2[7/8"] high pressure pipe (m) $L_2\,$: Length of ø19.05[3/4"] high pressure pipe (m) $L_3\,$: Length of ø15.88[5/8"] high pressure pipe (m) $L_4\,$: Length of ø15.88[5/8"] liquid pipe (m)

 L_5 : Length of ø12.7[1/2"] liquid pipe (m) L_6 : Length of ø9.52[3/8"] liquid pipe (m) L_7 : Length of ø6.35[1/4"] liquid pipe (m)

 α_1 , α_2 , α_3 , α_4 , α_1' , α_2' , α_3' , α_4' : Refer to the table below.

 L_1' : Length of ø22.2[7/8"] high pressure pipe [ft] L_2' : Length of ø19.05[3/4"] high pressure pipe [ft]

 L_2' : Length of ø19.05[3/4"] high pressure pipe [ft] L_3' : Length of ø15.88[5/8"] high pressure pipe [ft]

 L_4' : Length of ø15.88[5/8"] liquid pipe [ft] L_5' : Length of ø12.7[1/2"] liquid pipe [ft] L_6' : Length of ø9.52[3/8"] liquid pipe [ft] L_7' : Length of ø6.35[1/4"] liquid pipe [ft]

β. β' : Refer to the table below.

Outdoor unit total index	Amount for the BC controllers (standard/main)			
	α ₁ (kg)	α ₁ ' (oz)		
HP72 model	3.0	106		
HP96 model	4.5	160		
HP144 model	6.0	212		
HP192 model	0.0			

BC controller (main)						
HA type $\alpha_2(kg)$ α_2' (
1	71					
	•					

BC controller (sub)							
Total number of BC $\alpha_3(kg)$ $\alpha_3'(oz)$							
1	1.0	36					
2	2.0	71					

Total capacity of connected indoor		Amount for the Indoor unit		
u	units		α ₄ (kg)	α ₄ ' (oz)
	-	27	2.0	71
28	-	54	2.5	89
55	-	126	3.0	106
127	-	144	3.5	124
145	-	180	4.5	159
181	-	234	5.0	177
235	-	273	6.0	212
274	-	307	8.0	283

Outdoor unit	total index	Charged amount for Out- door Unit(s)		
		β (kg)	β' (oz)	
Single	HP72 model	0.0	0	
Sirigie	HP96 model	1.0	36	
Combination	HP144 model	0.0	0	
Combination	HP192 model	2.0	71	

Round up the calculation result to the nearest 0.1kg. (Example: 18.04kg to 18.1kg)

Round up the calculation result in increments of 4oz (0.1kg) or round it up to the nearest 1oz. (Example: 78.21oz to 79oz)

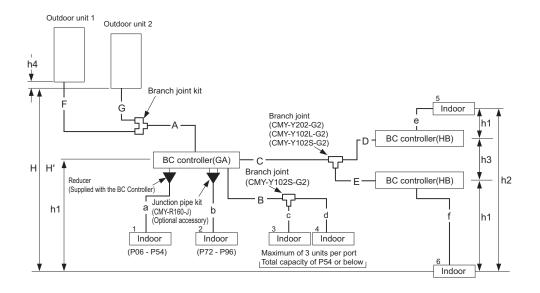
1) Maximum refrigerant charge

There is a limit to the amount of refrigerant that can be charged into a unit. Regardless of the amount yielded by the formula above, observe the maximum refrigerant charge in the table below.

Total index of the outdoor units	HP72	HP96	HP144	HP192
Maximum refrigerant charge *1 (kg)	39.0	47.3	58.5	86.3
Maximum refrigerant charge *1 [lbs-oz]	86-0	104-3	129-0	190-3

^{*1} Maximum refrigerant charge: the amount of factory-charged refrigerant and the amount of refrigerant to be added on site.

(2) Example



(3) Sample calculation

```
Outdoor unit 1:96 model
            Outdoor unit 2:96 model
            Indoor unit 1:30 model
                                         A: \phi 22.2
                                                        [7/8"]
                                                                  40m [131ft]
                                                                                   a: $\phi 9.52 [3/8"]
                                                                                                        10m [32ft]
            Indoor unit 2:96 model
                                         B: \phi 9.52
                                                        [3/8"]
                                                                  10m [32ft]
                                                                                   b: \phi 9.52 [3/8"]
                                                                                                         5m [16ft]
When
            Indoor unit 3:12 model
                                         C: \phi 9.52
                                                        [3/8"]
                                                                  20m [65ft]
                                                                                   c: \phi 6.35 [1/4"]
                                                                                                         5m [16ft]
            Indoor unit 4:15 model
                                         D: \phi9.52
                                                        [3/8"]
                                                                    5m [16ft]
                                                                                   d: $\phi 6.35 \quad \text{[1/4"]}
                                                                                                        10m [32ft]
            Indoor unit 5 : 12 model
                                         E: \phi 9.52
                                                        [3/8"]
                                                                    5m [16ft]
                                                                                   e: $\phi 6.35 [1/4"]
                                                                                                         5m [16ft]
                                                                    3m [9ft]
            Indoor unit 6 : 24 model
                                         F: \phi 19.05
                                                        [3/4"]
                                                                                   f: \phi 9.52 [3/8"]
                                                                                                         5m [16ft]
                                         G: \phi 19.05
                                                        [3/4"]
                                                                    1m [3ft]
```

The aggregate length of each liquid pipe type.

 ϕ 22.2 A = 40m [131ft] ϕ 19.05 F+G = 4m [13ft] ϕ 9.52 B+C+D+E+a+b+f = 60m [196ft] ϕ 6.35 c+d+e = 20m [65ft]

The piping length between the outdoor unit and the farthest indoor unit F + A + C + D + e = 73 meters [239ft], which is longer than 30.5 m [100 ft].

Therefore,

The amount of refrigerant to be charged [kg]=40×0.21+4×0.14+60×0.054+20×0.021+6+2+5+2=27.7 kg

The amount of refrigerant to be charged [oz]=131×2.26+13×1.51+196×0.59+65×0.23+212+71+177+71=978 oz

6-9-4 Refrigerant Charge Adjustment Mode

Follow the procedures below to add or extract refrigerant as necessary depending on the operation mode.

When the function switch (SW4 (922)) on the main board on the outdoor unit (OC only) is turned to ON, the unit goes into the refrigerant amount adjust mode, and the following sequence is followed.

Note

The unit will not go into the refrigerant amount adjust mode when the switch on the OS is set to ON.

Operation

When the unit is in the refrigerant amount adjust mode, the LEV on the indoor unit does not open as fully as it normally does during cooling operation to secure subcooling.

Note

- Adjust the refrigerant amount based on the values of TH4, SC11, SC16, and Tc, following the flowchart below. The TH4, SC11, SC16, and Tc values can be displayed by using the self-diagnosis switch (SW4 (SW6-10: OFF)) on the control board of the OC or OS.
- 2) There may be cases when the refrigerant amount may seem adequate for a short while after starting the unit in the refrigerant amount adjust mode but turn out to be inadequate later on (when the refrigerant system stabilizes).

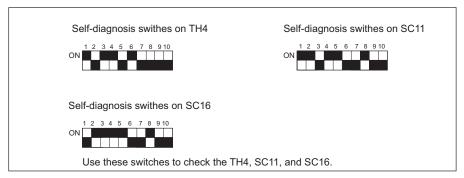
When the amount of refrigerant is truly adequate.

Subcool (SC11 and SC16) of the BC controller is 5°C [9°F] or above and SH on the indoor unit is between 5 and 15°C [9 and 27°F].

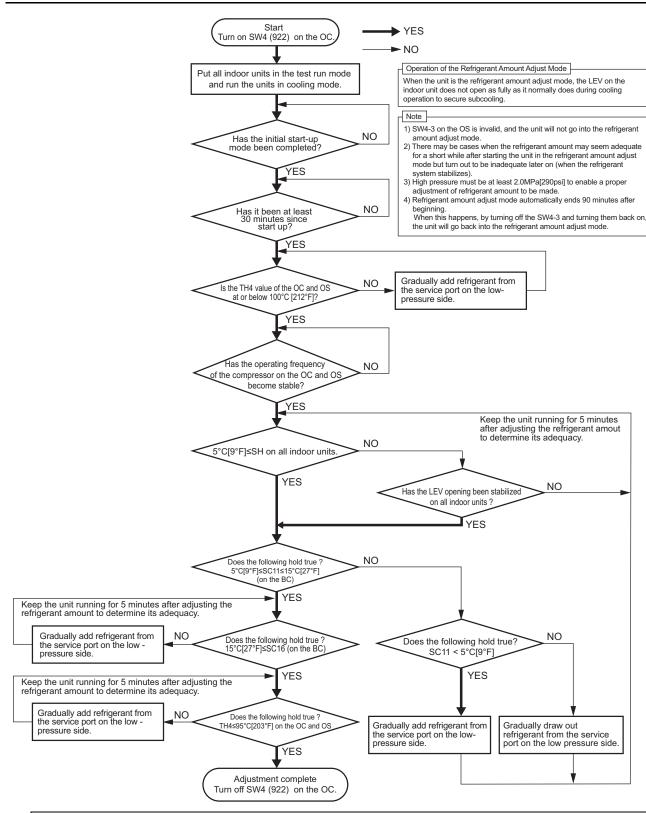
The refrigerant amount may seem adequate at the moment, but may turn out to be inadequate later on.

Subcool (SC11 and SC16) of the BC controller is 5°C [9°F] or less and SH on the indoor unit is 5°C [9°F] or less. Wait until the Subcool (SC11 and SC16) of the BC controller reaches 5°C [9°F] or above and the SH of the indoor unit is between 5 and 15°C [9 and 27°F] to determine that the refrigerant amount is adequate.

- •SC11: Subcool of liquid refrigerant at BC controller inlet; SC16: Subcool of liquid refrigerant at BC controller outlet
- 3) High pressure must be at least 2.0MPa [290psi] to enable a proper adjustment of refrigerant amount to be made.
- 4) Refrigerant amount adjust mode automatically ends 90 minutes after beginning. When this happens, by turning off the SW4 (922) and turning them back on, the unit will go back into the refrigerant amount adjust mode.



•For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)





Do not release the extracted refrigerant into the air.

⚠

CAUTION

Charge liquid refrigerant (as opposed to gaseous refrigerant) into the system.

•If gaseous refrigerant is charged into the system, the composition of the refrigerant in the cylinder will change and may result in performance loss.

6-10 The Following Symptoms Are Normal

Symptoms	Remote controller display	Cause
The indoor unit does not start after starting cooling (heating) operation.	"Cooling (heating)" icon blinks on the display.	The unit cannot perform a heating (cooling) operation when other indoor units on the same refrigerant system, are performing a cooling (heating) operation.
The auto vane adjusts its position by itself.	Normal display	After an hour of cooling operation with the auto vane in the vertical position, the vane may automatically move into the horizontal position. Louver blades will automatically move into the horizontal position while the unit is in the defrost mode, pre-heating stand-by mode, or when the thermostat triggers unit off.
The fan speed changes during heating.	Normal display	Very Low fan speed when "Thermo-OFF.' Changes from Very Low to preset fan speed when "Thermo-ON" depending on pipe temperature.
The fan stops during heating operation.	Defrost	The fan remains stopped during defrost operation.
The fan keeps running after the unit has stopped.	Unlit	When the auxiliary heater is turned on, the fan operates for one minute after stopping to dissipate heat.
The fan speed does not reach the set speed when operation switch is turned on.	STAND BY	The fan operates at extra low speed for 5 minutes after it is turned on or until the pipe temperature reaches 35°C[95°F], then it operates at low speed for 2 minutes, and finally it operates at the set speed. (Pre-heating stand-by)
When the main power is turned on, the display shown on the right appears on the indoor unit remote controller for 5 minutes.	"HO" or "PLEASE WAIT" icons blink on the display.	The system is starting up. Wait until the blinking display of "HO" or "PLEASE WAIT" go off.
The drain pump keeps running after the unit has stopped.	Unlit	The drain pump stays in operation for three minutes after the unit in the cooling mode is stopped.
The drain pump is running while the unit is stopped.	Unlit	When drain water is detected, the drain pump goes into operation even while the unit is stopped.
Outdoor unit, indoor unit, or BC controller makes noise when the operation mode is switched between Cooling and Heating.	Normal display	This noise is made when the refrigerant circuit is reversed and is normal.
Sound of the refrigerant flow is heard from the indoor unit immediately after starting operation.	Normal display	This is caused by the transient instability of the refrigerant flow and is normal.
Warm air sometimes comes out of the indoor units that are not in the heating mode.	Normal display	This is due to the fact that the LEVs on some of the indoor units are kept slightly open to prevent the refrigerant in the indoor units that are not operating in the heating mode from liquefying and accumulating in the compressor. It is part of a normal operation.

6-11 Standard Operation Data (Reference Data)

6-11-1 Single Unit (Standard)

	Outo	door unit model		PURY-HP72T(Y)KMU-A(-H)	PURY-HP96T(Y)KMU-A(-H)		
		controller model		CMB-P104NU-G	CMB-P104NU-G		
	<u> </u>	Indoor		26.7°C/19.4°C [80 °F/67 °F]	26.7°C/19.4°C [80 °F/67 °F]		
	Ambient temperature (cooling)	Outdoor	DB/WB	35°C/- [95 °F/-]	35°C/- [95 °F/-]		
		Indoor		21.1°C/- [70 °F/-]	21.1°C/- [70 °F/-]		
	Ambient temperature (heating)	Outdoor	DB/WB	8.3°C/6.1°C [47 °F/43 °F]	8.3°C/6.1°C[47 °F/43 °F]		
		Number of units connected		3	2		
	Indoor unit	Number of units in operation	Unit	3	2		
Conditions		Model	-	24/24/24	48/48		
		Main pipe		5 [16-3/8"]	5 [16-3/8"]		
	Piping	Branch pipe	m [ft]	10 [32-3/4"]	10 [32-3/4"]		
		Total pipe length		35 [114-13/16"]	25 [82]		
	Fan speed		-	Hi	Hi		
	Refrigerant charge		kg [lbs-oz]	19.8 [43-10]	21.5 [47-6]		
	Outdoor unit	Voltage ^{*1}	V	230	230		
Cooling-Only		3					
J,	Electric current*1		А	15.7	21.7		
Outdoor unit	Compressor frequency		Hz	43	61		
151/	EV opening BC controller (1/2/3)		<u> </u>			200/200/200	387/387
ing			Pulse	2000/-/180	2000/-/170		
	High pressure (63HS1)/Low pressure (63LS)			2.65/0.92 [384/133]	2.78/0.90 [403/131]		
Pressure			MPa [psi]	2.59/2.59 [375/375]	2.70/2.70 [392/392]		
	Discharge (TH4)			76 [169]	87 [189]		
	Heat exchan Accumulator Outdoor unit	Heat exchanger outlet (TH3)		41 [106]	41 [106]		
		Accumulator inlet		14 [57]	8 [46]		
Section		Accumulator outlet		14 [57]	8 [46]		
tempera- tures		Compressor inlet	°C [°F]	23 [73]	19 [66]		
		Compressor shell bottom		34 [93]	40 [104]		
		LEV inlet		24 [75]	19 [66]		
	Indoor unit	Heat exchanger inlet		12 [54]	6 [43]		
Heating-Only	1						
	Electric current*1		Α	17.1	24.1		
Outdoor unit	Compressor frequency		Hz	57	76		
LEV open-	Indoor unit			203/203/203	406/406		
ing	BC controller (1/2/3)		Pulse	110/-/520	110/-/590		
D.:	High pressure (63HS1)/l	Low pressure (63LS)	ME : "	2.52/0.7 [365/102]	2.52/0.63 [365/91]		
Pressure	BC controller on the liqu	id side (PS1)/Mid-way point (PS3)	MPa [psi]	2.45/2.13 [355/309]	2.48/2.27 [360/329]		
		Discharge (TH4)		68 [154]	78 [172]		
		Heat exchanger inlet (TH6)		2 [36]	0 [32]		
	Outdoor un't	Accumulator inlet		1 [34]	-2 [28]		
Section	Outdoor unit	Accumulator outlet	.c	1 [34]	-3 [27]		
tempera- tures		Compressor inlet	°C [°F]	1 [34]	-3 [27]		
		Compressor shell bottom		40 [104]	40 [104]		
	Indoor unit LEV inlet Heat exchanger inlet			30 [86]	36 [97]		
				62 [144]	68 [154]		

^{*1.} Measurements of current and voltage that are listed in the table above are those of the TKMU model.

6-11-2 **Dual Unit Combination (Standard)**

	Packa	aged unit model			PURY-HP144T	(Y)SKMU-A(-H)	
Outdoor unit model				PURY-HP72T(Y)KMU-A(-H) PURY-HP72T(Y)KMU-A(-H)			(Y)KMU-A(-H)
	BC c	ontroller model			CMB-P10	I D8NU-GA	
Ambient temperature Indoor					26.7°C/19.4°C	C [80 °F/67 °F]	
	(cooling)	Outdoor	DB/WB		35°C/-	[95 °F/-]	
	Ambient temperature Indoor				21.1°C/-	· [70 °F/-]	
	(heating) Outdoor		DB/WB		8.3°C/6.1°C	[47 °F/43 °F]	
		Number of units connected	11-7		-	4	
	Indoor unit	Number of units in operation	Unit		-	4	
Conditions		Model	-		36/36	/36/36	
		Main pipe			5	[16-3/8"]	
	Piping	Branch pipe	m [ft]		10	[32-3/4"]	
		Total pipe length			45	[147-5/8"]	
	Fan speed		-		ŀ	l i	
	Refrigerant charge		kg [lbs-oz]		36.6	[80-11]	
	Outdoor unit	Voltage*1	V	23	30	2	30
Cooling-Only	1						
Outdoor unit	Electric current*1		А		32	2.4	
Outdoor driit	Compressor frequency		Hz	4	13	4	13
LEV open-	Indoor unit		Pulse		275/275	/275/275	
ing	BC controller (1/2/3)		1 dioc		2000/20	000/250	
Pressure	High pressure (63HS1)/L	ow pressure (63LS)	MPa [psi]	2.65/0.91	[384/131]	2.65/0.91	[384/131]
1 Tessure	BC controller on the liquid side (PS1)/Mid-way point (PS3)		iiii a [poi]	2.59/2.59 [:		[375/375]	
	Outdoor unit Discharge (TH4) Heat exchanger outlet (TH3) Accumulator inlet Accumulator outlet		76	[169]	76	[169]	
		Heat exchanger outlet (TH3)		41	[106]	41	[106]
		Accumulator inlet		14	[57]	14	[57]
Section tempera-		Accumulator outlet	°C [°F]	14	[57]	14	[57]
tures		Compressor inlet	-[.]	23	[73]	23	[73]
		Compressor shell bottom		34	[93]	34	[93]
	Indoor unit	LEV inlet			22	[72]	
		Heat exchanger inlet			13	[55]	
Heating-Only							
Outdoor unit	Electric current*1		Α	35.3			
	Compressor frequency		Hz	5	57		57
LEV open- ing	Indoor unit		Pulse			/350/350	
iiig	BC controller (1/2/3)				110/1	10/870	
Pressure	High pressure (63HS1)/L		MPa [psi]	2.52/0.70	[365/102]		[365/102]
	BC controller on the liqui	d side (PS1)/Mid-way point (PS3)			2.45/2.13	1	
		Discharge (TH4)			[154]	68	[154]
	Outdoor unit	Heat exchanger inlet (TH6)			[36]		[36]
		Accumulator inlet			[34]		[34]
Section tempera-		Accumulator outlet	°C [°F]		[34]	1	
tures		Compressor inlet		1		1	[34]
		Compressor shell bottom		40	[104]	40	[104]
	Indoor unit	LEV inlet			28		
Heat exchanger inlet					67	[153]	

^{*1.} Measurements of current and voltage that are listed in the table above are those of the TKMU model.

	Pack	aged unit model			PURY-HP192T	(Y)SKMU-A(-H)	
		door unit model		PURY-HP96T(Y)KMU-A(-H) PURY-HP96T(Y)KMU-			(Y)KMU-A(-H)
		controller model		. 6.1. 1 66.	CMB-P108NU-GA		(1) 7 (11)
Indoor							
	Ambient temperature (cooling) Outdoor		DB/WB	26.7°C/19.4°C [80 °F/67 °F] 35°C/- [95 °F/-]			
	Indoor					· [70 °F/-]	
	Ambient temperature (heating) Outdoor		DB/WB		8.3°C/6.1°C		
		Number of units connected				[47 1743 1] 	
	Indoor unit	Number of units in operation	Unit			3 6	
Conditions	indoor unit	Model Model	-			/30/36/36	
Conditions			-				
	Distant	Main pipe	501			[16-3/8"]	
	Piping	Branch pipe	m [ft]		10	[32-3/4"]	
		Total pipe length				[213-1/4"]	
	Fan speed		-		H		
	Refrigerant charge	T	kg [lbs-oz]			[85-5]	
	Outdoor unit	Voltage*1	V	23	30	23	30
Cooling-Only			T				
Outdoor unit	Electric current*1		Α			I.8	
	Compressor frequency		Hz	6	i1 	6	1
LEV open- ing	Indoor unit		Pulse	230/2		230/230/275/275	
"ig	BC controller (1/2/3)				2000/20	000/270	
Pressure	High pressure (63HS1)/I	Low pressure (63LS)	MPa [psi]	2.78/0.90	[403/131]	2.78/0.90	[403/131]
	BC controller on the liqu	id side (PS1)/Mid-way point (PS3)			2.70/2.70	[392/392]	
		Discharge (TH4)		87	[189]	87	[189]
	Outdoor unit	Heat exchanger outlet (TH3)		41	[106]	41	[106]
		Accumulator inlet		8	[46]	8	[46]
Section tempera-		Accumulator outlet	°C [°F]	8	[46]	8	[46]
tures		Compressor inlet	0[1]	19	[66]	19	[66]
		Compressor shell bottom		42	[108]	40	[104]
	Indoor unit	LEV inlet			19	[66]	
	mador anit	Heat exchanger inlet	exchanger inlet		6 [43]		
Heating-Only	1						
Outdoor unit	Electric current*1		Α		49	9.7	
Outdoor unit	Compressor frequency		Hz	7	6	7	6
LEV open-	Indoor unit		Pulse		295/295/295	/295/350/350	
inġ	BC controller (1/2/3)		Pulse		110/11	0/1050	
Pressure	High pressure (63HS1)/l	Low pressure (63LS)	MDo Incil	2.52/0.63	[365/91]	2.52/0.63	[365/91]
Pressure	BC controller on the liqu	id side (PS1)/Mid-way point (PS3)	MPa [psi]		2.48/2.27	[360/329]	
		Discharge (TH4)		78	[172]	78	[172]
		Heat exchanger inlet (TH6)		0	[32]	0	[32]
		Accumulator inlet		-2	[28]	-2	[28]
Section	Outdoor unit	Accumulator outlet		-3	[27]	-3	[27]
tempera- tures		Compressor inlet	°C [°F]	-3	[27]	-3	[27]
		Compressor shell bottom		40	[104]	40	[104]
		LEV inlet			36	[97]	
	Indoor unit Heat exchanger inlet				68	[154]	
	i	i e		1			

^{*1.} Measurements of current and voltage that are listed in the table above are those of the TKMU model.

Chapter 7 Troubleshooting Using Error Codes

7-1	Error Code and Preliminary Error Code Lists	. 175
7-2 7-2-1	Error Code Definitions and Solutions: Codes [0 - 999]	
7-3	Error Code Definitions and Solutions: Codes [1000 - 1999]	. 180
7-3-1	Error Code [1102]	. 180
7-3-2	Error Code [1301]	. 181
7-3-3	Error Code [1302] (during operation)	
7-3-4	Error Code [1302] (at startup)	. 183
7-3-5	Error Code [1500]	. 183
7-4	Error Code Definitions and Solutions: Codes [2000 - 2999]	. 184
7-4-1	Error Code [2500] (Models with a drain sensor)	. 184
7-4-2	Error Code [2500] (Models with a float switch)	. 185
7-4-3	Error Code [2502] (Models with a drain sensor)	
7-4-4	Error Code [2502] (Models with a float switch)	
7-4-5	Error Code [2503]	
7-4-6	Error Code [2600]	
7-4-7	Error Code [2601]	
7-4-8	Error Code [2602]	. 190
7-5	Error Code Definitions and Solutions: Codes [3000 - 3999]	
7-5-1	Error Code [3121]	. 191
7-6	Error Code Definitions and Solutions: Codes [4000 - 4999]	
7-6-1	Error Code [4102] (TKMU)	
7-6-2	Error Code [4102] (YKMU)	
7-6-3	Error Code [4106]	
7-6-4	Error Code [4109]	
7-6-5	Error Code [4115] (TKMU)	
7-6-6	Error Code [4115] (YKMU)	
7-6-7	Error Code [4116]	
7-6-8	Error Code [4121]	
7-6-9	Error Codes [4220, 4225] Detail Code 108 (TKMU)	
7-6-10	Error Codes [4220, 4225] Detail Code 108 (YKMU)	
	Error Codes [4220, 4225] Detail Code 109 (TKMU)	
	Error Codes [4220, 4225] Detail Code 109 (YKMU)	
7-6-13	Error Codes [4220, 4225] Detail Code 110 (TKMU)	
	Error Codes [4220, 4225] Detail Code 111 (TKMU)	
	Error Codes [4220, 4225] Detail Code 131	
	Error Code [4230] (TKMU)	
	Error Code [4230] (YKMU)	
	Error Code [4240] (TKMU)	
	Error Code [4240] (YKMU)	
7-6-21	Error Codes [4250, 4255] Detail Code 101 (TKMU)	
	Error Codes [4250, 4255] Detail Code 101 (YKMU)	
	Error Code [4250] Detail Codes 103, 106, and 107 (TKMU)	
	Error Code [4250] Detail Codes 106 and 107 (YKMU)	
7-6-25	Error Codes [4250, 4255] Detail Code 104	
7-6-26	Error Codes [4250, 4255] Detail Code 105	

7-6-27	Error Code [4260] (TKMU)	209
7-6-28	Error Code [4260] (YKMU)	209
7-7	Error Code Definitions and Solutions: Codes [5000 - 5999]	210
7-7-1	Error Codes [5101, 5102, 5103, 5104]	210
7-7-2	Error Codes [5104, 5105, 5106, 5107, 5109, 5111]	211
7-7-3	Error Code [5110] (TKMU)	212
7-7-4	Error Code [5110] (YKMU)	212
7-7-5	Error Codes [5111, 5112, 5115, 5116]	213
7-7-6	Error Code [5201]	214
7-7-7	Error Codes [5201, 5203]	214
7-7-8	Error Code [5301] Detail Code 115 (TKMU)	215
7-7-9	Error Code [5301] Detail Code 115 (YKMU)	215
7-7-10	Error Code [5301] Detail Code 116 (TKMU)	216
7-7-11	Error Code [5301] Detail Code 117	216
7-7-12	Error Code [5301] Detail Code 118 (TKMU)	217
7-7-13	Error Code [5301] Detail Code 119 (TKMU)	217
7-7-14	Error Code [5301] Detail Code 119 (YKMU)	218
7-7-15	Error Code [5301] Detail Code 120 (TKMU)	218
7-7-16	Error Code [5301] Detail Code 120 (YKMU)	219
7-7-17	Error Codes [5305] Detail Code 132	219
7-7-18	Error Codes [5305] Detail Code 133	220
7-7-19	Error Codes [5305] Detail Code 134	221
7-7-20	Error Code [5401]	221
7-7-21	Error Code [5402]	222
7-7-22	Error Code [5403]	222
7-7-23	Error Code [5701]	222
7-8	Error Code Definitions and Solutions: Codes [6000 - 6999]	223
704		
7-8-1	Error Code [6201]	223
7-8-1 7-8-2	Error Code [6201] Error Code [6202]	
		223
7-8-2	Error Code [6202]	223
7-8-2 7-8-3	Error Code [6202]	223 224 224
7-8-2 7-8-3 7-8-4	Error Code [6202] Error Code [6600] Error Code [6601]	223 224 224 225
7-8-2 7-8-3 7-8-4 7-8-5	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602]	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603]	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606]	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-9	Error Code [6202]	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-9	Error Code [6202]	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-9 7-8-10	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606] Error Code [6607] Error Source Address = Outdoor Unit (OC). Error Code [6607] Error Source Address = BC Controller (BC) Error Code [6607] Error Source Address = Indoor Unit (IC) Error Code [6607] Error Source Address = LOSSNAY (LC).	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-9 7-8-10 7-8-11 7-8-12	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606] Error Code [6607] Error Source Address = Outdoor Unit (OC). Error Code [6607] Error Source Address = BC Controller (BC) Error Code [6607] Error Source Address = Indoor Unit (IC).	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-9 7-8-10 7-8-11 7-8-12 7-8-13	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606] Error Code [6607] Error Source Address = Outdoor Unit (OC). Error Code [6607] Error Source Address = BC Controller (BC). Error Code [6607] Error Source Address = Indoor Unit (IC). Error Code [6607] Error Source Address = LOSSNAY (LC). Error Code [6607] Error Source Address = ME Remote Controller	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-9 7-8-10 7-8-11 7-8-12 7-8-13	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606] Error Code [6607] Error Source Address = Outdoor Unit (OC). Error Code [6607] Error Source Address = BC Controller (BC). Error Code [6607] Error Source Address = Indoor Unit (IC). Error Code [6607] Error Source Address = LOSSNAY (LC). Error Code [6607] Error Source Address = ME Remote Controller Error Code [6607] Error Source Address = System Controller	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-9 7-8-10 7-8-11 7-8-12 7-8-13 7-8-14	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606] Error Code [6607] Error Source Address = Outdoor Unit (OC). Error Code [6607] Error Source Address = BC Controller (BC). Error Code [6607] Error Source Address = Indoor Unit (IC). Error Code [6607] Error Source Address = LOSSNAY (LC). Error Code [6607] Error Source Address = ME Remote Controller Error Code [6607] Error Source Address = System Controller Error Code [6607] All Error Source Address = System Controller	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-9 7-8-10 7-8-11 7-8-12 7-8-13 7-8-14 7-8-15 7-8-16	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606] Error Code [6607] Error Source Address = Outdoor Unit (OC). Error Code [6607] Error Source Address = BC Controller (BC) Error Code [6607] Error Source Address = Indoor Unit (IC) Error Code [6607] Error Source Address = LOSSNAY (LC). Error Code [6607] Error Source Address = ME Remote Controller Error Code [6607] Error Source Address = System Controller Error Code [6607] All Error Source Addresses. Error Code [6607] No Error Source Addresses.	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-10 7-8-11 7-8-12 7-8-13 7-8-14 7-8-15 7-8-16 7-8-17	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606] Error Code [6607] Error Source Address = Outdoor Unit (OC). Error Code [6607] Error Source Address = BC Controller (BC). Error Code [6607] Error Source Address = Indoor Unit (IC). Error Code [6607] Error Source Address = LOSSNAY (LC). Error Code [6607] Error Source Address = ME Remote Controller Error Code [6607] Error Source Address = System Controller Error Code [6607] All Error Source Addresses. Error Code [6607] No Error Source Address Error Code [6607] No Error Source Address	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-10 7-8-11 7-8-12 7-8-13 7-8-14 7-8-15 7-8-16 7-8-17 7-8-18	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606] Error Code [6607] Error Source Address = Outdoor Unit (OC) Error Code [6607] Error Source Address = BC Controller (BC) Error Code [6607] Error Source Address = Indoor Unit (IC) Error Code [6607] Error Source Address = LOSSNAY (LC) Error Code [6607] Error Source Address = ME Remote Controller Error Code [6607] Error Source Address = System Controller Error Code [6607] All Error Source Addresses Error Code [6607] No Error Source Address Error Code [6608] Error Code [6608]	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-10 7-8-11 7-8-12 7-8-13 7-8-14 7-8-15 7-8-16 7-8-17 7-8-18	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606] Error Code [6607] Error Source Address = Outdoor Unit (OC) Error Code [6607] Error Source Address = BC Controller (BC) Error Code [6607] Error Source Address = Indoor Unit (IC) Error Code [6607] Error Source Address = LOSSNAY (LC) Error Code [6607] Error Source Address = ME Remote Controller Error Code [6607] Error Source Address = System Controller Error Code [6607] All Error Source Addresses Error Code [6607] No Error Source Address Error Code [6608] Error Code [6831] Error Code [6832]	
7-8-2 7-8-3 7-8-4 7-8-5 7-8-6 7-8-7 7-8-8 7-8-10 7-8-11 7-8-12 7-8-13 7-8-14 7-8-15 7-8-16 7-8-17 7-8-18	Error Code [6202] Error Code [6600] Error Code [6601] Error Code [6602] Error Code [6603] Error Code [6606] Error Code [6606] Error Code [6607] Error Source Address = Outdoor Unit (OC). Error Code [6607] Error Source Address = BC Controller (BC). Error Code [6607] Error Source Address = Indoor Unit (IC). Error Code [6607] Error Source Address = LOSSNAY (LC). Error Code [6607] Error Source Address = ME Remote Controller Error Code [6607] Error Source Address = System Controller Error Code [6607] All Error Source Addresses. Error Code [6607] No Error Source Addresses Error Code [6608] Error Code [6831] Error Code [6833]	

7-9-2	Error Code [7101]	. 240
7-9-3	Error Code [7102]	. 241
7-9-4	Error Code [7105]	. 242
7-9-5	Error Code [7106]	. 242
7-9-6	Error Code [7107]	. 243
7-9-7	Error Code [7110]	. 244
7-9-8	Error Code [7111]	. 244
7-9-9	Error Code [7113]	. 245
	Error Code [7117]	
7-9-11	Error Code [7130]	. 247

7-1 Error Code and Preliminary Error Code Lists

					Sea	rched	unit		
Error Code	Prelimi- nary error code	Error (prelim- inary) detail code	Error code definition	Outdoor unit	Indoor unit	BC controller	LOSSNAY	Remote controller	Notes
0403	4300 4305	1 5 (Note)	Serial communication error/Panel communication error	0	0				(page 179)
1102	1202	-	Discharge temperature fault	0					(page 180)
1301	-	-	Low pressure fault	0					(page 181)
1302	1402	-	High pressure fault	0					(page 182)
1500	1600	-	Refrigerant overcharge	0					(page 183)
-	1605	-	Preliminary suction pressure fault	0					
2500	-	-	Drain sensor submergence		0				(page 184)
2502	-	-	Drain pump fault		0	0			(page 186)
2503	-	-	Drain sensor (Thd) fault		0		0		(page 188)
2600	-	-	Water leakage				0		(page 189)
2601	-	-	Water supply cutoff				0		(page 189)
2602	-	-	Function setting error				0		(page 190)
3121	_	_	Out-of-range outside air temperature	0					(page 191)
4102	4152	_	Open phase						(page 192)
4106	_	_	Transmission power supply fault	0					(page 194)
4109	-	-	Fan operation status detection error		0				(page 194)
4115	_	_	Power supply signal sync error	0					(page 195)
4116	_	_	RPM error/Motor error		0		0		(page 196)
4121	4171	-	Function setting error	0					(page 196)
		[0]	Backup operation	0					
		[108]	Abnormal bus voltage drop	0					(page 197)
4220	4320 4325	[109]	Abnormal bus voltage rise	0					(page 199)
4225 (Note)	(Note)	[110]	VDC error	0					(page 200)
		[111]	Logic error	0					(page 200)
		[131]	Low bus voltage at startup	0					(page 201)
4230	4330	-	Heatsink overheat protection	0					(page 202)
4240	4340	-	Overload protection	0					(page 203)
		[0]	Backup operation	0					
		[101]	IPM error	0					(page 204)
4250	4350	[103]	DCCT overcurrent (H/W detection)	0					(page 206)
4255	4355	[104]	Short-circuited IPM/Ground fault	0					(page 207)
(Note)	(Note)	[105]	Overcurrent error due to short-circuited motor	0					(page 208)
		[106]	Instantaneous overcurrent (S/W detection)	0					(page 206)
		[107]	Overcurrent (effective value)(S/W detection)	0					(page 206)
4260	-	-	Heatsink overheat protection at startup	0					(page 209)

						Sea	rched	unit		
Error Code	- ,	Error (prelim- inary) detail code	Error c	ode definition	Outdoor unit	Indoor unit	BC controller	LOSSNAY	Remote controller	Notes
5101	1202		Temperature sensor	Return air temperature (TH21)		0				(page 210)
3101	1202	_	fault	OA processing unit inlet temperature (TH4)				0		(page 210)
5102	1217	_	Temperature sensor	Indoor unit pipe temperature (TH22)		0				(page 210)
0102	1217		fault	OA processing unit pipe temperature (TH2)				0		(page 210)
			Temperature sensor	Indoor unit gas-side pipe temperature (TH23)		0				(page 210)
5103	1205	00	fault	OA processing unit gas- side pipe temperature (TH3)				0		(page 210)
				OA processing unit intake air temperature (TH1)				0		(page 210)
5104	1202	-	Temperature sensor fault	Outside temperature (TH24)		0				(page 210) Detectable only by the All- Fresh type in- door units
					Outdoor unit discharge temperature (TH4)	0				
5105	1204	-	Temperature sensor fault	Accumulator inlet temperature (TH5)	0					(page 211)
5106	1216	-	Temperature sensor fault	Heat exchanger inlet temperature (TH6)	0					(page 211)
5107	1221	-	Temperature sensor fault	Outside temperature (TH7)	0					(page 211)
5109	1273	-	Temperature sensor fault	ON-defrost (TH9)	0					(page 211)
		[0]	Backup operation		0					
5110	1214	01	Temperature sensor fault	Heatsink temperature (THHS)	0					(page 212)
			Temperature sensor	ON-defrost (TH11)	0					(page 211)
5111	1274	-	fault	Liquid inlet temperature (TH11)			0			(page 213)
5112	-	-	T	Bypass outlet temperature (TH12)			0			(page 213)
5115	-	-	Temperature sensor fault (BC controller)	LEV3 outlet temperature (TH15)			0			(page 213)
5116	-	-		LEV3 inlet temperature (TH16)			0			(page 213)
5201	-	-	High-pressure sensor fault (63HS1)		0					(page 214)
5201	1402	-	High-pressure sensor (Outdoor unit HPS/BC	fault controller PS1)	0		0			(page 214)
5203	-	-	Intermediate pressure (BC controller PS3)	sensor fault			0			(page 214)

	Error Code Preliminary error code code effinition error code efficiency detail code Error code definition		Searched unit						
_			Outdoor unit	Indoor unit	BC controller	LOSSNAY	Remote controller	Notes	
		[0]	Backup operation	0					
		[115]	ACCT sensor fault	0					(page 215)
		[116]	DCCT sensor fault	0					(page 216)
5301	4300	[117]	ACCT sensor circuit fault	0					(page 216)
		[118]	DCCT sensor circuit fault	0					(page 217)
		[119]	Open-circuited IPM/Loose ACCT connector	0					(page 217)
		[120]	Faulty ACCT wiring	0					(page 218)
		[0]	Backup operation	0					
5305	4305	[132]	Position detection error at startup	0					(page 219)
3303	4303	[133]	Position detection error during operation	0					(page 220)
		[134]	RPM error before startup	0					(page 221)
5401	-	-	Humidity sensor fault		0		0		(page 221)
5402	-	-	Outside humidity sensor fault				0		(page 222)
5403	ı	1	Aging degradation of outside humidity sensor				0		(page 222)
5701	ı	1	Loose float switch connector		0				(page 222)
6201	-	-	Remote controller board fault (nonvolatile memory error)					0	(page 223)
6202	-	-	Remote controller board fault (clock IC error)					0	(page 223)
6600	-	-	Address overlaps	0	0	0	0	0	(page 224)
6601	-	-	Polarity setting error					0	(page 224)
6602	-	-	Transmission processor hardware error	0	0	0	0	0	(page 225)
6603	-	-	Transmission line bus busy error	0	0	0	0	0	(page 226)
6606	-	-	Communication error between device and transmission processors	0	0	0	0	0	(page 226)
6607	-	-	No ACK error	0	0	0	0	0	(page 227)
6608	į	1	No response error	0	0	0	0	0	(page 234)
6831	1	1	MA controller signal reception error (No signal reception)		0			0	(page 235)
6832	1	1	MA remote controller signal transmission error (Synchronization error)		0			0	(page 236)
6833	-	-	MA remote controller signal transmission error (H/W error)		0			0	(page 237)
6834	-	-	MA controller signal reception error (Start bit detection error)		0			0	(page 238)
7100	-	-	Total capacity error						(page 239)
7101	-	-	Capacity code setting error		0		0		(page 240)
7102	=	-	Wrong number of connected units	0		0			(page 241)
7105		=	Address setting error	0					(page 242)
7106	-	-	Attribute setting error				0		(page 242)
7107	-	-	Port setting error			0			(page 243)

			Error code definition		Sea	rched	unit		
Error Code	Prelimi- nary error code	Error (prelim- inary) detail code			Indoor unit	BC controller	LOSSNAY	Remote controller	Notes
7110	-	-	Connection information signal transmission/reception error						(page 244)
7111	-	-	Remote controller sensor fault		0		0		(page 244)
7113	-	-	Function setting error (improper connection of CN-TYP)						(page 245)
7117	-	-	Model setting error						(page 246)
7130	-	-	Incompatible unit combination	0					(page 247)

Note

The last digit in the check error codes in the 4000's and 5000's and two-digit detail codes indicate if the codes apply to inverter on fan inverter.

Example

Code 4225 (detail code 108): Bus voltage drop in the fan inverter system Code 4230 : Heatsink overheat protection in the inverter system

The last digit	Inverter system
0 or 1	Compressor inverter system
5	Fan inverter system

7-2 Error Code Definitions and Solutions: Codes [0 - 999]

7-2-1 Error Code [0403]

1. Error code definition

Serial communication error

2. Error definition and error detection method

Serial communication error between the control board and the INV board on the compressor, and between the control board and the Fan board

Detail code 1: Between the control board and the INV board

Detail code 5: Between the control board and the Fan board

3. Cause, check method and remedy

(1) Faulty wiring

Check the following wiring connections.

1) Between Control board and Fan board

Control board	FAN board
CN2,CN2A	CN80
CN4,CN4A	CN80

2) Between Fan board and INV board

FAN board	INV board
CN82	CN2
CN83	CN43

(2) INV board failure, Fan board failure and Control board failure

Replace the INV board or the Fan board or control board when the power turns on automatically, even if the power source is reset.

1. Error code definition

Panel communication error (Indoor unit)

2. Error definition and detection method

This error is detected when indoor units cannot successfully receive the signals from the Auto filter cleaning unit for one minute.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Incorrect switch setting on the indoor unit circuit board	Check SW3-3 on the indoor unit circuit board Set SW3-3 to ON only when connecting an auto filter cleaning unit.
(2)	Power wire that connects the circuit board on the indoor unit and the circuit board on the cleaning unit is loose.	Check the LED1 (cleaning unit circuit board (microcomputer power)). Lit: Power is supplied properly. Unlit: Check for loose or disconnected power wire between the indoor unit circuit board (CNAC) and the cleaning unit circuit board (CN3A).
(3)	Communication wire that connects the circuit board on the indoor unit and the circuit board on the cleaning unit is loose.	Check the LED4 (cleaning unit circuit board (communication)). Blinking: Normal communication Unlit: Check for loose or disconnected communication wire between the indoor unit circuit board (CN3G) and the cleaning unit
(4)	Panel transceiver circuit fault (cleaning unit)	circuit board (CN3G). If the LED blinks at irregular intervals (normally blinks at 0.5-sec-
(5)	Panel transceiver circuit fault (indoor unit)	ond intervals), electrical interference is suspected. Check the items above, turn the power off, and turn the power
(6)	Electrical interference on the cleaning unit's communication cable	back on. If the error persists, replace either the cleaning unit circuit board or the indoor unit circuit board.

Note

For inverter-related error codes, refer to the following page(s).

[8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

[8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-3 Error Code Definitions and Solutions: Codes [1000 - 1999]

7-3-1 Error Code [1102]

1. Error code definition Discharge temperature fault

2. Error definition and error detection method

- 1) If the discharge temperature of 120 °C [248°F] or more is detected during the above operation (the first detection), the outdoor unit stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes automatically.
- 2) If the discharge temperature of 120° C [248°F] or more is detected again (the second detection) within 30 minutes after the second stop of the outdoor unit described above, the mode will be changed to 3 minute restart mode, then the outdoor unit will restart in 3 minutes.
- 3) If the discharge temperature of 120°C [248°F] or more is detected (the third detection) within 30 minutes after the stop of the outdoor unit described above (regardless of the first or the second stop), the outdoor unit will make an error stop, and the error code "1102" will be displayed.
- 4) If the discharge temperature of 120°C [248°F] or more is detected more than 30 minutes after the previous stop of the outdoor unit, the detection is regarded as the first detection, and the operation described in step 1 above will start.
- 5) For 30 minutes after the stop (the first stop or the second stop) of the outdoor unit, preliminary errors will be displayed on the LED display.

	Cause	Check method and remedy
(1)	Gas leak, gas shortage	Refer to the following page(s).[6-9 Evaluating and Adjusting Refrigerant Charge](page 161)
(2)	Overload operation	Check operating conditions and operation status of indoor/ outdoor units.
(3) (4) (5) (6) (7) (8)	LEV failure on the indoor unit BC controller LEV malfunction Cooling only: LEV3 Cooling main: LEV1,3 Heating only or heating main: LEV3 Defrost: LEV3 BC controller SVM1 and 2 malfunction → Cooling only or defrost BC controller SVA malfunction → Cooling only or cooling main BC controller SVB malfunction → Heating only or heating main Solenoid valve actuation failure (SV4a, SV4b, or SV4d) → heating only, heating main	Perform a heating operation and check the operation. Cooling: LEV on the indoor unit BC controller LEV1,3 SVM1,2 SVA,C Heating: LEV on the indoor unit BC controller LEV3 SVB SV4a, SV4b, SV4d Refer to the following page(s). [8-8 Troubleshooting LEV Problems](page 273)
(9)	Port address setting error.	Confirm the port address of the indoor unit.
(10)	Closed ball valve	Confirm that the ball valve is fully open.
(11)	Outdoor fan (including fan parts) failure, motor failure, or fan controller malfunction Rise in discharge temp. by low pressure drawing for (3) - (11).	Check the fan on the outdoor unit. Refer to the following page(s). [8-7 Troubleshooting Outdoor Unit Fan Problems](page 272)
(12)	Gas leak between low and high pressures (4-way valve failure, Compressor failure, Solenoid valve (SV1a) failure)	Perform a cooling or heating operation and check the operation.
(13)	Thermistor failure (TH4)	Refer to the following page(s). [7-7-2 Error Codes [5104, 5105, 5106, 5107, 5109, 5111]](page 211)
(14)	Input circuit failure on the controller board thermistor	Check the inlet air temperature on the LED monitor.

7-3-2 Error Code [1301]

1. Error code definition Low pressure fault

2. Error definition and error detection method

When starting the compressor from Stop Mode for the first time if low pressure reads 0.098MPa [14psi] immediately before start-up, the operation immediately stops.

	Cause	Check method and remedy
(1)	Inner pressure drop due to a leakage.	Refer to the following page(s). [8-5-3 Comparing the Low-
(2)	Low pressure sensor failure	Pressure Sensor Measurement and Gauge Pressure](page 268)
(3)	Short-circuited pressure sensor cable due to torn outer rubber	
(4)	A pin on the male connector is missing.	
(5)	Disconnected wire	
(6)	Failure of the low pressure input circuit on the controller board	

7-3-3 Error Code [1302] (during operation)

1. Error code definition

High pressure fault 1 (Outdoor unit)

2. Error definition and error detection method

- 1) If the pressure of 3.78MPa [548psi] or higher is detected by the pressure sensor during operation (the first detection), the outdoor stops once, turns to antirestart mode for 3 minutes, and restarts after 3 minutes automatically.
- 2) If the pressure of 3.78MPa [548psi] or higher is detected by the pressure sensor again (the second detection) within 30 minutes after the first stop of the outdoor unit, the outdoor unit stops once, turns to anti-restart mode for 3 minutes, and restarts after 3 minutes automatically.
- 3) If the pressure of 3.87MPa [561psi] or higher is detected by the pressure sensor (the third detection) within 30 minutes of the second stop of the outdoor unit, the outdoor unit will make an error stop, and the error code "1302" will be displayed.
- 4) If the pressure of 3.78MPa [548psi] or higher is detected more than 30 minutes after the stop of the outdoor unit, the detection is regarded as the first detection, and the operation described in step 1 above will start.
- 5) For 30 minutes after the stop of the outdoor unit, preliminary errors will be displayed on the LED display.
- The outdoor unit makes an error stop immediately when not only the pressure sensor but also the pressure switch detects 4.15^{+0,-0.15} MPa [601^{+0,-22} psi]

	Cause	Check method and remedy
(1) (2)	Indoor unit LEV actuation failure BC controller LEV malfunction Heating only or heating main: Indoor LEV 3	Perform a heating operation and check the operation. Cooling: LEV on the indoor unit BC controller LEV1,3, SVM1,1b,2,2b, SVA
(3)	Defrost : LEV3 BC controller SVM1 and 2 malfunction →Cooling only or defrost BC controller SVA and SVC malfunction	Heating: LEV on the indoor unit BC controller LEV3, SVM2,2b, SV4a,SV4b, SV4d Refer to the following page(s). [8-8 Troubleshooting
(4)	→ Cooling only or cooling main BC controller SVB malfunction → Heating only or heating main Solenoid valve actuation failure (SV4a, SV4b, or SV4d) → Cooling only or cooling main	LEV Problems](page 273)
(6)	Port address setting error.	Confirm the port address of the indoor unit.
(7)	Refrigerant service valve actuation failure	Confirm that the refrigerant service valve is fully
(8)	Short cycle on the indoor unit side	Check the indoor units for problems and correct
(9)	Clogged filter on the indoor unit	them, if any.
(10)	Reduced air flow due to dirty fan on the indoor unit fan	
(11)	Dirty heat exchanger of the indoor unit	
(12)	Indoor fan (including fan parts) failure or motor failure Items (7) through (12) above reduce the condensing capability of the unit, resulting in high-pressure rise during heating operation.	
(13) (14)	Short cycle on the outdoor unit Dirty heat exchanger of the outdoor unit	Check the outdoor units for problems and correct them, if any.
(15)	Outdoor fan (including fan parts) failure, motor failure, or fan controller malfunction ltems (13) through (15) above reduce the condensing capability of the unit, resulting in high-pressure rise during cooling operation.	Check the fan on the outdoor unit. Refer to the following page(s). [8-7 Troubleshooting Outdoor Unit Fan Problems](page 272)
(16)	Solenoid valve (SV1a) malfunction The by-pass valve (SV1a) can not control rise in high pressure.	Refer to the following page(s). [8-6 Troubleshooting Solenoid Valve Problems](page 269)
(17)	Thermistor failure (TH9, TH11, TH7)	Refer to the following page(s). [7-7-2 Error Codes [5104, 5105, 5106, 5107, 5109, 5111]](page 211)
(18)	Pressure sensor failure	Refer to the following page(s). [8-5-1 Comparing the High-Pressure Sensor Measurement and Gauge Pressure](page 267)
(19)	Failure of the thermistor input circuit and pressure sensor input circuit on the controller board	Check the sensor temperature/pressure on the LED monitor.
(20)	Thermistor mounting problem (TH9, TH11, TH7)	Check the sensor temperature/pressure on the LED
(21)	Disconnected male connector on the pressure switch (63H1) or disconnected wire	monitor.

7-3-4 Error Code [1302] (at startup)

1. Error code definition

High pressure fault 2 (Outdoor unit)

2. Error definition and error detection method

If the pressure of 0.098MPa [14psi] or lower is registered on the pressure sensor immediately before start-up, it will trigger an abnormal stop, and error code "1302" will be displayed.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Inner pressure drop due to a leakage.	Refer to the following page(s). [8-5-1 Comparing the
(2)	Pressure sensor failure	High-Pressure Sensor Measurement and Gauge Pressure](page 267)
(3)	Shorted-circuited pressure sensor cable due to torn outer rubber	
(4)	A pin on the male connector on the pressure sensor is missing or contact failure	
(5)	Disconnected pressure sensor cable	
(6)	Failure of the pressure sensor input circuit on the controller board	

7-3-5 Error Code [1500]

1. Error code definition

Refrigerant overcharge

2. Error definition and error detection method

An error can be detected by the discharge temperature superheat.

- If the formula "TdSH ≤ 10°C [18°F]" is satisfied during operation (first detection), the outdoor unit stops, goes into the 3-minute restart mode, and starts up in three minutes.
- 2) If the formula "TdSH ≤ 10°C [18°F]" is satisfied again within 30 minutes of the first stoppage of the outdoor unit (second detection), the unit comes to an abnormal stop, and the error code "1500" appears.
- 3) If the formula "TdSH ≤ 10°C [18°F]" is satisfied 30 minutes or more after the first stoppage of the outdoor unit, the same sequence as Item "1 above (first detection) is followed.
- 4) For 30 minutes after the stop of the outdoor unit, preliminary errors will be displayed on the LED display.

	Cause	Check method and remedy
(1)	Overcharged refrigerant	Refer to the following page(s). [6-9 Evaluating and Adjusting Refrigerant Charge](page 161)
(2)	Thermistor input circuit failure on the control board	Check the temperature and pressure readings on the sensor that are displayed on the LED monitor.
(3)	Faulty mounting of thermistor (TH4)	Check the temperature and pressure readings on the thermistor that are displayed on the LED monitor.
(4)	Solenoid valve actuation failure (SV5b)	Perform a cooling or heating operation and check the oper-
(5)	Solenoid valve actuation failure (SV4a, SV4b, or SV4d) → Heating only or heating main	ation. [8-8 Troubleshooting LEV Problems](page 273)
(6)	LEV5a failure→ Heating only or heating main	
(7)	LEV4 failure→ Heating only or heating main	

7-4 Error Code Definitions and Solutions: Codes [2000 - 2999]

7-4-1 Error Code [2500] (Models with a drain sensor)

1. Error code definition Drain sensor submergence

2. Error definition and error detection method

- 1) If an immersion of the drain sensor in the water is detected while the unit is in any mode other than the Cool/Dry mode and when the drain pump goes from OFF to ON, this condition is considered preliminary water leakage. While this error is being detected, humidifier output cannot be turned on.
- 2) If the immersion of the sensor in the water is detected four consecutive times at an hour interval, this is considered water leakage, and "2500" appears on the monitor.
- 3) Detection of water leakage is also performed while the unit is stopped.
- 4) Preliminary water leakage is cancelled when the following conditions are met:
 - •One hour after the preliminary water leakage was detected, it is not detected that the drain pump goes from OFF to ON.
 - •The operation mode is changed to Cool/Dry.
 - •The liquid pipe temperature minus the inlet temperature is -10°C [-18°F] or less.

	Cause		Check method and remedy
(1)	Drain water drainage problem Clogged drain pump Clogged drain piping Backflow of drain water from other units		Check for proper drainage.
(2)	Adhesion of water drops to the drain sensor •Trickling of water along the lead wire •Rippling of drain water caused by filter clogging	1) 2)	Check for proper lead wire installation. Check for clogged filter.
(3)	Failure of the relay circuit for the solenoid valve		Replace the relay.
(4)	Indoor unit control board failure Drain sensor circuit failure		If the above item checks out OK, replace the indoor unit control board.

7-4-2 Error Code [2500] (Models with a float switch)

1. Error code definition Drain sensor submergence

2. Error definition and error detection method

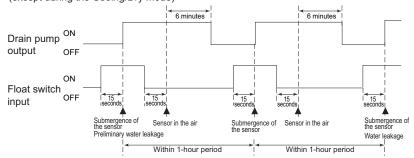
- 1) If an immersion of the float switch in the water is detected while the unit is in any mode other than the Cool/Dry mode and when the drain pump goes from OFF to ON, this condition is considered preliminary water leakage. While this error is being detected, humidifier output cannot be turned on.
- 2) If the drain pump turns on within one hour after preliminary water leakage is detected and the above-mentioned condition is detected two consecutive times, water leakage error water leakage is detected, and "2500" appears on the monitor.
- 3) Detection of water leakage is also performed while the unit is stopped.
- 4) Preliminary water leakage is cancelled when the following conditions are met:
 - •One hour after the preliminary water leakage was detected, it is not detected that the drain pump goes from OFF to ON.
 - The operation mode is changed to Cool/Drv.
 - •The liquid pipe temperature minus the inlet temperature is 10°C [-18°F] or less.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Drain water drainage problem •Clogged drain pump •Clogged drain piping •Backflow of drain water from other units	Check for proper drainage.
(2)	Stuck float switch Check for slime in the moving parts of the float switch.	Check for normal operation of the float switch.
(3)	Float switch failure	Check the resistance with the float switch turned on and turned off.

<Reference>

Drain pump operation triggered by a submergence of the liquid level sensor (except during the Cooing/Dry mode)



7-4-3 Error Code [2502] (Models with a drain sensor)

1. Error code definition Drain pump fault

2. Error definition and error detection method

- 1) Make the drain sensor thermistor self-heat. If the temperature rise is small, it is interpreted that the sensor is immersed in water. This condition is considered to be a preliminary error, and the unit goes into the 3-minute restart delay mode.
- 2) If another episode of the above condition is detected during the preliminary error, this is considered a drain pump error, and "2502" appears on the monitor.
- 3) This error is always detected while the drain pump is in operation.
- 4) The following criteria are met when the criteria for the forced stoppage of outdoor unit (system stoppage) are met.
 - *"Liquid pipe temperature inlet temperature ≤ -10°C [-18 °F] " has been detected for 30 minutes.
 - *The immersion of drain sensor is detected 10 consecutive times.
 - *The conditions that are listed under items 1) through 3) above are always met before the criteria for the forced stoppage of the outdoor unit.
- 5) The indoor unit that detected the conditions that are listed in item 4) above brings the outdoor unit in the same refrigerant circuit to an error stop (compressor operation prohibited), and the outdoor unit brings all the indoor units in the same refrigerant circuit that are in any mode other than Fan or Stop to an error stop. "2502" appears on the monitor of the units that came to an error stop.
- 6) Forced stoppage of the outdoor unit
 - Detection timing: The error is detected whether the unit is in operation or stopped.
- 7) Ending criteria for the forced stoppage of outdoor unit
 - Power reset the indoor unit that was identified as the error source and the outdoor unit that is connected to the same refrigerant circuit.

Forced stoppage of the outdoor unit cannot be cancelled by stopping the unit via the remote controller. (Note) Items 1) - 3) and 4) - 7) are detected independently from each other.

Note

The address and attribute that appear on the remote controller are those of the indoor unit (or OA processing unit) that caused the error.

	Cause		Check method and remedy
(1)	Drain pump failure		Check for proper functioning of the drain pump.
(2)	Drain water drainage problem •Clogged drain pump •Clogged drain piping		Check for proper drainage.
(3)	Adhesion of water drops to the drain sensor •Trickling of water along the lead wire •Rippling of drain water caused by filter clogging	1) 2)	Check for proper lead wire installation. Check for clogged filter.
(4)	Indoor unit control board failure *Drain pump drive circuit failure *Drain heater output circuit failure		If the above item checks out OK, replace the indoor unit control board.
(5)	Items (1) through (4) above and an indoor unit electronic valve closure failure (leaky valve) occurred simultaneously.		Check the solenoid valves on the indoor unit for leaks.

7-4-4 Error Code [2502] (Models with a float switch)

Error code definition Drain pump fault

2. Error definition and error detection method

- 1) The immersion of sensor tip in water is detected by the ON/OFF signal from the float switch.
 - *Submergence of the sensor
 - When it is detected that the float switch has been ON for 15 seconds, it is interpreted that the sensor tip is immersed in water.
 - *Sensor in the air
 - When it is detected that the float switch has been OFF for 15 seconds, it is interpreted that the sensor tip is not immersed in water.
- 2) If it is detected that the float switch has been ON for 3 minutes after the immersion of the sensor tip was detected, this is considered a drain pump failure, and "2502" appears on the monitor.
 - *The total time it takes for this error to be detected is 3 minutes and 15 seconds, including the time it takes for the first immersion of the sensor tip to be detected.
- 3) Detection of drain pump failure is performed while the unit is stopped.
- 4) The following criteria are met when the criteria for the forced stoppage of outdoor unit (system stoppage) are met.
 - *"Liquid pipe temperature inlet temperature ≤ 10°C [-18°F] " has been detected for 30 minutes.
 - *It is detected by the float switch that the sensor tip has been immersed in water for 15 minutes or more.
 - *The conditions that are listed under items 1) through 3) above are always met before the criteria for the forced stoppage of the outdoor unit.
- 5) The indoor unit that detected the conditions that are listed in item 4) above brings the outdoor unit in the same refrigerant circuit to an error stop (compressor operation prohibited), and the outdoor unit brings all the indoor units in the same refrigerant circuit that are in any mode other than Fan or Stop to an error stop.
- 6) Forced stoppage of the outdoor unit
 - Detection timing: The error is detected whether the unit is in operation or stopped.
 - This error is detected whether the unit is in operation or stopped.
- 7) Ending criteria for the forced stoppage of outdoor unit
 - Power reset the indoor unit that was identified as the error source and the outdoor unit that is connected to the same refrigerant circuit.
 - Forced stoppage of the outdoor unit cannot be cancelled by stopping the unit via the remote controller.
 - (Note) Items 1) 3) and 4) 7) are detected independently from each other.

Note |

The address and attribute that appear on the remote controller are those of the indoor unit (or OA processing unit) that caused the error.

	Cause	Check method and remedy
(1)	Drain pump failure	Check for proper functioning of the drain pump mechanism
(2)	Drain water drainage problem Clogged drain pump Clogged drain piping	Check for proper drainage.
(3)	Stuck float switch Check for slime in the moving parts of the float switch.	Check for normal operation of the float switch.
(4)	Float switch failure	Check the resistance with the float switch turned on and turned off.
(5)	Indoor unit control board failure Drain pump drive circuit failure Float switch input circuit failure	Replace indoor unit control board.
(6)	Items (1) through (5) above and an indoor unit electronic valve closure failure (leaky valve) occurred simultaneously.	Check the solenoid valves on the indoor unit for leaks.

7-4-5 Error Code [2503]

1. Error code definition Drain sensor (Thd) fault

2. Error definition and error detection method

- •If the open or short circuit of the thermistor has been detected for 30 seconds, this condition is considered to be a preliminary error, and the unit goes into the 3-minute restart delay mode.
- •If another episode of the above condition is detected during the preliminary error, this is considered a drain sensor error.(If the short or open circuit of the thermistor is no longer detected, normal operation will be restored in 3 minutes.)
- •This error is detected when one of the following conditions are met.
 - *During Cool/Dry operation
 - *Liquid pipe temperature minus inlet temperature is equal to or smaller than 10°C [-18°F] (except during the defrost cycle)
 - *When the liquid temperature thermistor or suction temperature thermistor or short or open circuited.
 - *Drain pump is in operation.
 - *One hour has elapsed since the drain sensor went off.

Short: 90°C [194 °F] or above Open: - 20°C [-4 °F] or below

	Cause		Check method and remedy	
(1)	Faulty connector (CN31) insertion.	1)	Check for connector connection failure. Reinsert the connector, restart the operation, and check for proper operation.	
(2)	Broken or semi-broken thermistor wire	2)	Check for a broken thermistor wire.	
(3)	Thermistor failure	3)	Check the resistance of the thermistor. $0^{\circ}\text{C}[32\ ^\circ\text{F}]:6.0\ k\Omega$ $10^{\circ}\text{C}[50\ ^\circ\text{F}]:3.9\ k\Omega$ $20^{\circ}\text{C}[68^{\circ}\text{F}]:2.6\ k\Omega$ $30^{\circ}\text{C}[86^{\circ}\text{F}]:1.8\ k\Omega$ $40^{\circ}\text{C}[104\ ^\circ\text{F}]:1.3\ k\Omega$	
(4)	Indoor unit control board (error detection circuit) failure	4)	Replace the indoor unit control board if the problem recurs when the unit is operated with the No1 and No2 pins on the drain sensor connector (CN31) being short-circuited. If the above item checks out OK, there are no problems with the drain sensor. Turn off the power and turn it back on.	

7-4-6 Error Code [2600]

1. Error code definition Water leakage

2. Cause, check method and remedy

Check that water does not leak from the pipes in such as the humidifier.

7-4-7 Error Code [2601]

1. Error code definition Water supply cutoff

Cause		Check method and remedy	
(1)	The water tank of the humidifier is empty.	Check the amount of supply water. Check for the solenoid valve and for the connection.	
(2)	The solenoid valve for humidification is OFF.	Check the connector.	
(3)	Disconnected float switch	Check the connecting part.	
(4)	Poor operation of float switch	Check for the float switch.	
(5)	Frozen water tank	Turn off the power source of the water tank to defrost, and turn it on again.	

7-4-8 Error Code [2602]

- 1. Error code definition Function setting error
- 2. Cause, check method and remedy

Cause	Check method and remedy
The function selection switch on the LOSS-NAY unit (SW5-5) is set to ON.	Set the function selection switch (SW5-5) on the LOSSNAY unit to OFF.

7-5 Error Code Definitions and Solutions: Codes [3000 - 3999]

7-5-1 Error Code [3121]

1. Error code definition

Out-of-range outside air temperature

2. Error definition and error detection method

- •When the thermistor temperature of -32°C[-25°F] or below has continuously been detected for 3 minutes during heating operation (during compressor operation), the unit makes an error stop and "3121" appears on the display. (Use the OC thermistor temperature to determine when two outdoor units are in operation.)
- •The compressor restarts when the thermistor temperature is -26°C[-15°F] or above (both OC and OS) during error stop. (The error display needs to be canceled by setting the remote controller.)
- •Outdoor temperature error is canceled if the units stop during error stop. (The error display needs to be canceled by setting the remote controller.)

3. Cause, check method and remedy

Check the following factors if an error is detected, without drop in the outdoor temperature.

	Cause	Check method and remedy
(1)	Thermistor failure	Check thermistor resistance.
(2)	Pinched lead wire	Check for pinched lead wire.
(3)	Torn wire coating	Check for wire coating.
(4)	A pin on the male connector is missing or contact failure	Check connector.
(5)	Disconnected wire	Check for wire.
(6)	Thermistor input circuit failure on the control board	Check the intake temperature of the sensor with the LED monitor. When the temperature is far different from the actual temperature, replace the control board.

<Reference>

Short detection Open detection TH7 110 °C [230 °F] and above (0.4 k Ω) -40 °C [-40 °F] and below (130 k Ω)

7-6 Error Code Definitions and Solutions: Codes [4000 - 4999]

7-6-1 Error Code [4102] (TKMU)

1. Error code definition Open phase

2. Error definition and error detection method

•An open phase of the power supply was detected at power on.

Note

The open phase of the power supply may not always be detected if a power voltage from another circuit is applied.

	Cause	Check method and remedy
(1)	Power supply problem Open phase voltage of the power supply Power supply voltage drop	Check the input voltage to the power supply terminal block TB1.
(2)	Noise filter problem Coil problem Circuit board failure	Check the coil connections. Check for coil burnout. Confirm that the voltage at the CN001 connector is 188 V or above.
(3)	Wiring failure	Check Noise filter CN110, relay connector CNFG2, and control board CN110 connector for damage to wire or for incomplete connection. Check Noise filter CN012 and control board CNAC connector.
(4)	Blown fuse	Check F01 on the control board, F4, and F5 for a blown fuse>If a blown fuse is found, check for a short-circuiting or earth fault of the actuator.
(5)	Control board failure	Replace the control board if none of the above is causing the problem.

7-6-2 Error Code [4102] (YKMU)

1. Error code definition Open phase

2. Error definition and error detection method

- •An open phase of the power supply (L1 phase, L2 phase) was detected at power on.
- •The L3 phase current is outside of the specified range.

Note

The open phase of the power supply may not always be detected if a power voltage from another circuit is applied.

	Cause	Check method and remedy
(1)	Power supply problem Open phase voltage of the power supply Power supply voltage drop	Check the input voltage to the power supply terminal block TB1.
(2)	Noise filter problem Coil problem Circuit board failure	Check the coil connections. Check for coil burnout. Check that the voltage across TB21 and TB22 on the noise filter board is 414V or above.
(3)	Wiring failure	Confirm that the voltage at the control board connector CNAC is 190 V or above. If the voltage is below 190, check the wiring between noise filter CN6, noise filter CN2, transformer box, and control board CNAC. Confirm that the wiring between noise filter TB23 and INV board SC-L3 is put through CT3.
(4)	Blown fuse	Check F01 on the control board, F4, and F5 for a blown fuse>If a blown fuse is found, check for a short-circuiting or earth fault of the actuator.
(5)	CT3 failure	Replace the inverter if this problem is detected after the compressor has gone into operation.
(6)	Control board failure	Replace the control board if none of the above is causing the problem.

7-6-3 Error Code [4106]

1. Error code definition

<Transmission power supply fault Error detail code FF (Outdoor unit)>

2. Error definition and error detection method

Transmission power output failure

3. Cause

- 1) Wiring failure
- 2) Transmission power supply cannot output voltage because overcurrent was detected.
- 3) Voltage cannot be output due to transmission power supply problem.
- 4) Transmission voltage detection circuit failure

4. Check method and remedy

Check the transmission power supply circuit on all outdoor units in a given refrigerant circuit for problems.

[8-12-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 308)

[8-13-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 310)

1. Error code definition

<Transmission power supply fault other than error detail code FF (Outdoor unit)>

2. Error definition and error detection method

Transmission power reception failure

3 Cause

One of the outdoor units stopped supplying power, but no other outdoor units start supplying power.

4. Check method and remedy

Check the transmission power supply circuit on all outdoor units in a given refrigerant circuit for problems.

[8-12-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 308)

[8-13-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 310)

7-6-4 Error Code [4109]

1. Error code definition

Indoor unit fan operation error

2. Error definition and error detection method

1) Connector CN28 has remained open-circuited for 100 consecutive secondsduring operation.

	Cause	Check method and remedy
(1)	Auxiliary relay (X13) fault	The coil or the wiring of the auxiliary relay connected to CN28 is faulty.
(2)	Connector (CN28) is disconnected.	Check the connector for proper connection.
(3)	Blown fuse	Check the fuse on the control circuit board.
(4)	Motor error (thermistor error inside the motor)	Check the unit fan for proper operation in the test run mode. If no problems are found with items 1 through 3 above and the fan does not operate, replace the motor.

7-6-5 Error Code [4115] (TKMU)

1. Error code definition

Power supply signal sync error

2. Error definition and error detection method

The frequency cannot be determined when the power is switched on.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Power supply error	Check the voltage of the power supply terminal block (TB1).
(2)	Noise filter problem •Coil problem •Circuit board failure	Check the coil connections. Check for coil burnout. Confirm that the voltage at the CN012 connector is 188 V or above.
(3)	Blown fuse	Check fuse F01 on the control board.
(4)	Wiring failure Between noise filter board CN012 and control board CNAC	Confirm that the voltage at the control board connector CNAC is 188 V or above.
(5)	Control board failure	If none of the items described above is applicable, and if the trouble reappears even after the power is switched on again, replace the control board.

7-6-6 Error Code [4115] (YKMU)

1. Error code definition

Power supply signal sync error

2. Error definition and error detection method

The frequency cannot be determined when the power is switched on.

	Cause	Check method and remedy
(1)	Power supply error	Check the voltage of the power supply terminal block (TB1).
(2)	Noise filter problem •Coil problem •Circuit board failure	Check the coil connections. Check for coil burnout. Check that the voltage across TB21 and TB22 on the noise filter board is 414V or above.
(3)	Blown fuse	Check F01 on the control board, F4, and F5 for a blown fuse.
(4)	Wiring failure Between noise filter CN6, noise filter CN2, transformer box, and control board CNAC	Confirm that the voltage at the control board connector CNAC is 190 V or above.
(5)	Control board failure	If none of the items described above is applicable, and if the trouble reappears even after the power is switched on again, replace the control board.

Error Code [4116] 7-6-7

1. Error code definition RPM error/Motor error

2. Error definition and error detection method

- *LOSSNAY

 - *The motor keep running even if the power is OFF.
 *The thermal overload relay is ON. (Only for the three-phase model)

If detected less than 180rpm or more than 2000rpm, the indoor unit will restart and keep running for 3 minutes. If detected again, the display will appear.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Board failure	Replace the board.
(2)	Motor malfunction	Check for the motor and the solenoid switch.
(3)	Solenoid switch malfunction	

Error Code [4121] 7-6-8

1. Error code definition **Function setting error**

2. Error source, cause, check method and remedy

Error source	Cause	Check method and remedy
Outdoor unit	(1) Dip switch setting error on the control board	Check the SW6-1 setting on the control board
	(2) Connector connection error on the control board	Check that nothing is connected to the connector CNAF on the control board.
	(3) Control board failure	Replace the control board if no problems are found with the two items above.

7-6-9 Error Codes [4220, 4225] Detail Code 108 (TKMU)

1. Error code definition

Abnormal bus voltage drop (Detail code 108)

2. Error definition and error detection method

If Vdc 160V or less is detected during Inverter operation. (S/W detection)

3. Cause, check method and remedy

(1) Power supply environment

Find out if there was a (momentary) power failure.

Check whether the power voltage is 188V or less across all phases.

(2) Voltage drop detected

4220

- •Check the voltage between SC-P1 and IPM N terminals on the INV board while the inverter is stopped.
- → Check the following items if it is 253V or above.
 - Confirm on the LED monitor that the bus voltage is above 160 V. Replace the INV board if it is below 160 V.
 - Check the voltage at CN72C on the control board. →Go to (3).
 - 3) Check the coil connections (L1 L3) and coil burnout.
 - Check the resistance of the diode stack. Refer to the following page(s). [8-10-15 Troubleshooting Problems with Diode Stack](page 297)
 - 5) Check the wiring connections between the following sections:
 - Between the noise filter board and INV board. Between the INV board and C1.
 - Replace the noise filter board if no problems are found.
 - → Check the following items if the voltage is below 253 V.
 - 1) Check the connection to SC-P1 and IPM N on the INV board.
 - 2) Check the wiring between the noise filter board and INV board.
 - Check the resistance of the diode stack. Refer to the following page(s). [8-10-15 Troubleshooting Problems with Diode Stack] (page 297)
 - 4) Check the in-rush current resistor value. Refer to the following page(s). [8-10-13 Simple Check on Inverter Circuit Components](page 295)
 - 5) Replace the noise filter board.

4225

- •Check the voltage at CNVDC on the Fan board while the inverter is stopped.
- →Check the following items if it is 253 V or above.
 - 1) Check the voltage at CN72C on the control board. →Go to 3).
 - 2) Check the coil connections (L1 L3) and for coil burnout.
 - 3) Check the wiring connections between noise filter board, inverter board, and fan board.

Replace the noise filter board, if no problems are found.

- If the problem recurs after replacing the noise filter, replace the Fan board.
- → Check the following items if the voltage is below 253V.
- 4) Check the CNVDC connector connection.

(3) Control board failure

Confirm that a voltage of 12 VDC is applied to the connector CN72C on the control board during inverter operation.

→If voltage is absent, check the fuse F01. If no problems are found, replace the control board.

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-6-10 Error Codes [4220, 4225] Detail Code 108 (YKMU)

1. Error code definition

Abnormal bus voltage drop (Detail code 108)

2. Error definition and error detection method

If Vdc 289V or less is detected during Inverter operation. (S/W detection)

3. Cause, check method and remedy

(1) Power supply environment

Find out if there was a (momentary) power failure.

Check whether the power voltage (Between L1 and L2, L2 and L3, and L1 and L3) is 414V or less across all phases.

(2) Voltage drop detected

4220

- •Check the voltage between the FT-P and FT-N terminals on the INV board while the inverter is stopped and if it is 420 V or above, check the following items.
 - 1) Confirm on the LED monitor that the bus voltage is above 289V.

Replace the INV board if it is below 289 V.

- 2) Check the voltage at CN72 on the control board. →Go to (3).
- 3) Check the noise filter coil connections and for coil burnout.
- 4) Check the wiring connections between the following sections

Between the noise filter board and INV board. Between the INV board and DCL. Replace 72C if no problems are found.

- 5) Check the IGBT module resistance on the INV board. Refer to the following page(s). [8-11-14 Troubleshooting Problems with IGBT Module](page 305)
- •Check the voltage between the FT-P and FT-N terminals on the INV board while the inverter is stopped and if it is less than 420 V, check the following items.
 - 1) Check the coil connections and for coil burnout on the noise filter.
 - 2) Check the wiring between the noise filter board and INV board.
 - 3) Check the connection to SCP1 and SC-P2 on the INV board.
 - 4) Check the in-rush current resistor value.
 - 5) Check the 72C resistance value.
 - 6) Check the DCL resistance value.

Replace the INV board if no problems are found.

4225

- •Check the voltage at CNVDC on the Fan board while the inverter is stopped and if it is 420 V or above, check the following items.
 - Check the voltage at CN72 on the control board. →Go to 3).
 - 2) Check the noise filter coil connections and for coil burnout.
 - 3) Check the wiring connections between the following sections

Between the noise filter board INV board and the Fan board.

4) Check contents 4220

Replace the Fan board if no problems are found.

- •Check the voltage at CNVDC on the Fan board while the inverter is stopped and if it is less than 420 V, check the following items.
 - 1) Check the state of the wiring connections between the INV board and the Fan board.
 - 2) Check contents 4220

Replace the Fan board if no problems are found.

(3) Control board failure

Check that 12VDC is applied to connector CN72 on the control board while the inverter is operating. If voltage is absent or the wrong voltage is applied, check the fuse F01. Replace the control board if no problems are found with the fuse.

Note

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-6-11 Error Codes [4220, 4225] Detail Code 109 (TKMU)

1. Error code definition

Abnormal bus voltage rise (Detail code 109)

2. Error definition and error detection method

If Vdc ≥ 400V is detected during inverter operation.

3. Cause, check method and remedy

(1) Different voltage connection

Check the power supply voltage on the power supply terminal block (TB1).

(2) INV board failure

If the problem recurs, replace the INV board or fan board.

In the case of 4220: INV board In the case of 4225: Fan board

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-6-12 Error Codes [4220, 4225] Detail Code 109 (YKMU)

1. Error code definition

Abnormal bus voltage rise (Detail code 109)

2. Error definition and error detection method

If Vdc ≥ 830V is detected during inverter operation.

3. Cause, check method and remedy

(1) Different voltage connection

Check the power supply voltage on the power supply terminal block (TB1).

(2) INV board failure

If the problem recurs, replace the INV board or fan board.

In the case of 4220: INV board In the case of 4225: Fan board

Note

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-6-13 Error Codes [4220, 4225] Detail Code 110 (TKMU)

1. Error code definition

VDC error (Detail code 110)

2. Error definition and error detection method

Bus voltage abnormality If Vdc ≥ 400V or Vdc ≤ 160V is detected. (H/W detection)

3. Cause, check method and remedy

Same as detail code No.108 and 109 of 4220 error

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-6-14 Error Codes [4220, 4225] Detail Code 111 (TKMU)

1. Error code definition

Logic error (Detail code 111)

2. Error definition and error detection method

H/W erroi

If only the H/W error logic circuit operates, and no identifiable error is detected.

3. Cause, Check method and remedy

In the case of 4220

	Cause	Check method and remedy
(1)	External noise	
(2)	INV board failure	Refer to the following page(s). [8-10-2 Checking the Inverter Board Error Detection Circuit](page 290)
(3)	IPM failure	Replace the IPM.
(4)	DCCT failure	Replace the DCCT.

In the case of 4225

	Cause	Check method and remedy
(1)	External noise	
(2)	Fan board failure	Refer to the following page(s). [8-10-7 Checking the Fan Board Error Detection Circuit at No Load](page 291) [8-10-8 Checking the Fan Inverter for Damage at No Load](page 292) [8-10-9 Checking the Fan Inverter for Damage with Load](page 293)

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-6-15 Error Codes [4220, 4225] Detail Code 111 (YKMU)

1. Error code definition

Logic error (Detail code 111)

2. Error definition and error detection method

H/W error

If only the H/W error logic circuit operates, and no identifiable error is detected.

3. Cause, Check method and remedy

In the case of 4220

	Cause	Check method and remedy
(1)	External noise	
(2)	INV board failure	Refer to the following page(s). [8-11-2 Checking the Inverter Board Error Detection Circuit](page 300)

In the case of 4225

	Cause	Check method and remedy
(1)	External noise	
(2)	Fan board failure	Refer to the following page(s). [8-11-7 Checking the Fan Board Error Detection Circuit at No Load](page 301) [8-11-8 Checking the Fan Inverter for Damage at No Load](page 302) [8-11-9 Checking the Fan Inverter for Damage with Load](page 303)

Note

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-6-16 Error Codes [4220, 4225] Detail Code 131

1. Error code definition

Low bus voltage at startup (Detail code 131)

2. Error definition and error detection method

When Vdc ≤160 V is detected just before the inverter operation.

3. Cause, check method and remedy

(1) Inverter main circuit failure

Same as detail code 108 of 4220 error

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

[8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-6-17 Error Code [4230] (TKMU)

Error code definition Heatsink overheat protection

2. Error definition and error detection method

When the heat sink temperature (THHS) remains at or above 90°C [194°F] is detected.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Fan board failure	Refer to the following page(s). [8-10-7 Checking the Fan Board Error Detection Circuit at No Load](page 291) [8-10-8 Checking the Fan Inverter for Damage at No Load](page 292) [8-10-9 Checking the Fan Inverter for Damage with Load](page 293)
(2)	Outdoor unit fan failure	Check the outdoor unit fan operation. If any problem is found with the fan operation, check the fan motor. Refer to the following page(s). [8-10-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 291)
(3)	Air passage blockage	Check that the heat sink cooling air passage is not blocked
(4)	THHS failure	Check the THHS sensor reading on the LED monitor. →If an abnormal value appears, check the sensor resistance, and replace the sensor as necessary.

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-6-18 Error Code [4230] (YKMU)

1. Error code definition

Heatsink overheat protection

2. Error definition and error detection method

When the heat sink temperature (THHS) remains at or above 100°C [212°F] is detected.

3. Cause, check method and remedy

	Cause		Check method and remedy
(1)	Fan board failure		Refer to the following page(s). [8-11-7 Checking the Fan Board Error Detection Circuit at No Load](page 301) [8-11-8 Checking the Fan Inverter for Damage at No Load](page 302) [8-11-9 Checking the Fan Inverter for Damage with Load](page 303)
(2)	Outdoor unit fan failure		Check the outdoor unit fan operation. If any problem is found with the fan operation, check the fan motor. Refer to the following page(s). [8-11-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 301)
(3)	Air passage blockage		Check that the heat sink cooling air passage is not blocked
(4)	THHS failure	1)	Check for proper installation of the INV board IGBT. (Check for proper installation of the IGBT heatsink.)
		2)	Check the THHS sensor reading on the LED monitor. →If an abnormal value appears, replace the INV board.

Note

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-6-19 Error Code [4240] (TKMU)

1. Error code definition Overload protection

2. Error definition and error detection method

If the output current of "(lac) > 53 (Arms)" or "THHS > 80°C [175°F]" is continuously detected for 10 minutes or more during inverter operation.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Air passage blockage	Check that the heat sink cooling air passage is not blocked
(2)	Power supply environment	Power supply voltage is 188 V or above.
(3)	Inverter failure	Refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)
(4)	Current sensor (ACCT) failure	Refer to the following page(s). [8-10-13 Simple Check on Inverter Circuit Components](page 295)
(5)	Compressor failure	Check that the compressor has not overheated during operation. → Check the refrigerant circuit (oil return section). Refer to the following page(s). [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290)

Note |

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-6-20 Error Code [4240] (YKMU)

1. Error code definition Overload protection

2. Error definition and error detection method

If the output current of "(lac) > 27 (Arms)" or "THHS > 95°C [203°F] " is continuously detected for 10 minutes or more during inverter operation.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Air passage blockage	Check that the heat sink cooling air passage is not blocked
(2)	Power supply environment	Power supply voltage is 414 V or above.
(3)	Inverter failure	Refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)
(4)	Compressor failure	Check that the compressor has not overheated during operation. → Check the refrigerant circuit (oil return section). Refer to the following page(s). [8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 300)

Note |

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-6-21 Error Codes [4250, 4255] Detail Code 101 (TKMU)

1. Error code definition IPM error (Detail code 101)

2. Error definition and error detection method

In the case of 4250

IPM error signal is detected.

In the case of 4255

IPM error signal is detected.

3. Cause, check method and remedy

In the case of 4250

	Cause	Check method and remedy
(1)	Inverter output related	Refer to the following page(s). [8-10-2 Checking the Inverter Board Error Detection Circuit](page 290) [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290) [8-10-4 Checking the Inverter for Damage at No-Load](page 290) [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291) [8-10-10 Checking the Installation Conditions](page 293)
(2)	Same as 4230 error	Same as 4230 error

In the case of 4255

	Cause	Check method and remedy
(1)	Fan motor abnormality	Refer to the following page(s). [8-10-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 291)
(2)	Fan board failure	Refer to the following page(s). [8-10-7 Checking the Fan Board Error Detection Circuit at No Load](page 291) [8-10-8 Checking the Fan Inverter for Damage at No Load](page 292) [8-10-9 Checking the Fan Inverter for Damage with Load](page 293)

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-6-22 Error Codes [4250, 4255] Detail Code 101 (YKMU)

1. Error code definition

IPM error (Detail code 101)

2. Error definition and error detection method

In the case of 4250

Overcurrent is detected by the overcurrent detection resistor (RSH) on the INV board.

In the case of 4255

IPM error signal is detected.

3. Cause, check method and remedy

In the case of 4250

Cause	Check method and remedy
(1) Inverter output related	Refer to the following page(s). [8-11-2 Checking the Inverter Board Error Detection Circuit](page 300) [8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 300) [8-11-4 Checking the Inverter for Damage at No-Load](page 300) [8-11-5 Checking the Inverter for Damage during Compressor Operation](page 301) [8-11-10 Checking the Installation Conditions](page 303) Check the IGBT module resistance value of the INV board, if no problems are found. [8-11-14 Troubleshooting Problems with IGBT Module](page 305)

In the case of 4255

	Cause	Check method and remedy
(1)	Fan motor abnormality	Refer to the following page(s). [8-11-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 301)
(2)	Fan board failure	Refer to the following page(s). [8-11-7 Checking the Fan Board Error Detection Circuit at No Load](page 301) [8-11-8 Checking the Fan Inverter for Damage at No Load](page 302) [8-11-9 Checking the Fan Inverter for Damage with Load](page 303)

Note

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-6-23 Error Code [4250] Detail Codes 103, 106, and 107 (TKMU)

1. Error code definition

DCCT overcurrent (H/W detection) (Detail code 103) Instantaneous overcurrent (Detail code 106) Overcurrent (effective value) (Detail code 107)

2. Error definition and error detection method

Overcurrent 106 Apeak or 64 Arms and above is detected by the current sensor.

3. Cause, check method and remedy

Cause	Check method and remedy	
(1) Inverter output related	Refer to the following page(s). [8-10-2 Checking the Inverter Board Error Detection Circuit](page 290) [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290) [8-10-4 Checking the Inverter for Damage at No-Load](page 290) [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291) [8-10-10 Checking the Installation Conditions](page 293)	

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-6-24 Error Code [4250] Detail Codes 106 and 107 (YKMU)

1. Error code definition

Instantaneous overcurrent (Detail code 106) Overcurrent (effective value) (Detail code 107)

2. Error definition and error detection method

Overcurrent 56 Apeak or 33 Arms and above is detected by the current sensor.

3. Cause, check method and remedy

Cause	Check method and remedy	
(1) Inverter output related	Refer to the following page(s). [8-11-2 Checking the Inverter Board Error Detection Circuit](page 300) [8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 300) [8-11-4 Checking the Inverter for Damage at No-Load](page 300) [8-11-5 Checking the Inverter for Damage during Compressor Operation](page 301) [8-11-10 Checking the Installation Conditions](page 303) Check the IGBT module resistance value of the INV board, if no problems are found. [8-11-14 Troubleshooting Problems with IGBT Module](page 305)	

Note |

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-6-25 Error Codes [4250, 4255] Detail Code 104

1. Error code definition

Short-circuited IPM/Ground fault (Detail code 104)

2. Error definition and error detection method

When IPM/IGBT short damage or grounding on the load side is detected just before starting the inverter.

3. Cause, check method and remedy

In the case of 4250

Cause	Check method and remedy	
(1) Grounding fault compressor	Refer to the following page(s). (TKMU) [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290) (YKMU) [8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 300)	
(2) Inverter output related	Refer to the following page(s). (TKMU) [8-10-2 Checking the Inverter Board Error Detection Circuit](page 290) [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290) [8-10-4 Checking the Inverter for Damage at No-Load](page 290) [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291) [8-10-10 Checking the Installation Conditions](page 293) (YKMU) [8-11-2 Checking the Inverter Board Error Detection Circuit](page 300) [8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 300) [8-11-4 Checking the Inverter for Damage at No-Load](page 300) [8-11-5 Checking the Inverter for Damage during Compressor Operation](page 301) [8-11-10 Checking the Installation Conditions](page 303)	

In the case of 4255

	Cause	Check method and remedy	
(1)	Grounding fault of fan motor	Refer to the following page(s). (TKMU) [8-10-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 291) (YKMU) [8-11-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 301)	
(2)	Fan board fail- ure	Refer to the following page(s). (TKMU) [8-10-7 Checking the Fan Board Error Detection Circuit at No Load](page 291) [8-10-8 Checking the Fan Inverter for Damage at No Load](page 292) [8-10-9 Checking the Fan Inverter for Damage with Load](page 293) (YKMU) [8-11-7 Checking the Fan Board Error Detection Circuit at No Load](page 301) [8-11-8 Checking the Fan Inverter for Damage at No Load](page 302) [8-11-9 Checking the Fan Inverter for Damage with Load](page 303)	

Note

For inverter-related error codes, refer to the following page(s).

[8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

[8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-6-26 Error Codes [4250, 4255] Detail Code 105

1. Error code definition

Overcurrent error due to short-circuited motor (Detail code 105)

2. Error definition and error detection method

When a short is detected on the load side just before starting the inverter operation.

3. Cause, Check method and remedy

In the case of 4250

Cause	Check method and remedy	
(1) Short - circuited compressor	Refer to the following page(s). (TKMU) [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290) (YKMU) [8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 300)	
(2) Output wiring	Check for a short circuit.	

In the case of 4255

	Cause	Check method and remedy	
(1)	Short - circuited fan motor	Refer to the following page(s). (TKMU) [8-10-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 291) (YKMU) [8-11-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 301)	
(2)	Output wiring	Check for a short circuit.	

Note |

For inverter-related error codes, refer to the following page(s).

[8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

[8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-6-27 Error Code [4260] (TKMU)

1. Error code definition

Heatsink overheat protection at startup

2. Error definition and error detection method

The heatsink temperature (THHS) remains at or above 90°C [194°F] for 10 minutes or more at inverter startup.

3. Cause, check method and remedy

Same as 4230 error

7-6-28 Error Code [4260] (YKMU)

1. Error code definition

Heatsink overheat protection at startup

2. Error definition and error detection method

The heatsink temperature (THHS) remains at or above 100°C [212°F] for 10 minutes or more at inverter startup.

3. Cause, check method and remedy

Same as 4230 error

7-7 Error Code Definitions and Solutions: Codes [5000 - 5999]

7-7-1 Error Codes [5101, 5102, 5103, 5104]

1. Error code definition

5101

Return air temperature sensor (TH21) fault (Indoor unit)

Return air temperature sensor (TH4) fault (OA processing unit)

5102

Pipe temperature sensor (TH22) fault (Indoor unit)

Pipe temperature sensor (TH2) fault (OA processing unit)

5103

Gas-side pipe temperature sensor (TH23) fault (Indoor unit)

Gas-side pipe temperature sensor (TH3) fault (OA processing unit)

5104

Intake air temperature sensor (TH1) fault (OA processing unit)

Intake air temperature sensor (TH24) fault (All-fresh (100% outdoor air) type indoor unit)

2. Error definition and error detection method

•If a short or an open is detected during thermostat ON, the outdoor unit turns to anti-restart mode for 3 minutes. When the error is not restored after 3 minutes (if restored, the outdoor unit runs normally), the outdoor unit makes an error stop.

Short: detectable at 90°C [194°F] or higher

Open: detectable at -40°C [-40°F] or lower

- •Sensor error at gas-side cannot be detected under the following conditions.
 - *During heating operation
 - *During cooling operation for 3 minutes after the compressor turns on.

	Cause	Check method and remedy
(1)	Thermistor failure	Check the thermistor resistor.
(2)	Connector contact failure	0°C [32°F]: 15 kΩ 10°C [50°F]: 9.7 kΩ
(3)	Disconnected wire or partial disconnected thermistor wire	20°C [68°F] : 6.4 kΩ 30°C [86°F] : 4.3 kΩ 40°C [104°F] : 3.1 kΩ
(4)	Unattached thermistor or contact failure	
(5)	Indoor board (detection circuit) failure	Check the connector contact. When no fault is found, the indoor board is a failure.

7-7-2 Error Codes [5104, 5105, 5106, 5107, 5109, 5111]

1. Error code definition

5104

Discharge temperature sensor (TH4) fault (Outdoor unit)

Accumulator inlet temperature sensor (TH5) fault (Outdoor unit)

5106

Heat exchanger inlet temperature sensor (TH6) fault (Outdoor unit)

Outside temperature sensor (TH7) fault (Outdoor unit)

5109

ON-defrost temperature sensor (TH9) error (outdoor unit)

ON-defrost temperature sensor (TH11) error (outdoor unit)

2. Error definition and error detection method

- •When a short (high temperature intake) or an open (low temperature intake) of the thermistor is detected (the first detection). the outdoor unit stops, turns to anti-restart mode for 3 minutes, and restarts when the detected temperature of the thermistor.
- •When a short or an open is detected again (the second detection) after the first restart of the outdoor unit, the outdoor unit stops, turns to anti-restart mode for 3 minutes, and restarts in 3 minutes when the detected temperature is within the normal range.
- •When a short or an open is detected again (the third detection) after the previous restart of the outdoor unit, the outdoor unit makes an error stop.
- •If a short- or open-circuited thermistor is detected immediately before restart, the unit comes to an abnormal stop, and an error code "5104""5105,""5106,""5107," "5109," or "5111" will appear on the display.

 During 3-minute antirestart mode, preliminary errors will be displayed on the LED display.
- •A short or an open described above is not detected for 10 minutes after the compressor start, during defrost mode, or for 3 minutes after defrost mode.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Thermistor failure	Check thermistor resistance.
(2)	Pinched lead wire	Check for pinched lead wire.
(3)	Torn wire coating	Check for wire coating.
(4)	A pin on the male connector is missing or contact failure	Check connector.
(5)	Disconnected wire	Check for wire.
(6)	Thermistor input circuit failure on the control board	Check the intake temperature of the sensor with the LED monitor. When the temperature is far different from the actual temperature, replace the control board.

<Reference>

	Short detection	Open detection
TH4	240°C [464°F] and above (0.57kΩ and below)	0°C [32°F] and below (698kΩ and above)
TH5	70°C [158°F] and above (0.4kΩ and below)	-40°C [-40°F] and below (130kΩ and above)
TH6	70°C [158°F] and above (1.14kΩ and below)	-40°C [-40°F] and below (130kΩ and above)
TH7	110°C [230°F] and above (0.4kΩ and below)	-40°C [-40°F] and below (130kΩ and above)
TH9	110°C [230°F] and above (0.4kΩ and below)	-40°C [-40°F] and below (130kΩ and above)
TH11	110°C [230°F] and above (0.4kΩ and below)	-40°C [-40°F] and below (130kΩ and above)

7-7-3 Error Code [5110] (TKMU)

1. Error code definition

Heatsink temperature sensor (THHS) fault (Detail code 01)

2. Error definition and error detection method

When a short or an open of THHS is detected just before or during the inverter operation.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	THHS sensor failure	Check the THHS sensor reading on the LED monitor. Replace the sensor if it reads below - 30°C[-22°F] or above 150°C[302°F].
(2)	Contact failure	Check the connector connection (CNTH) on the INV board.

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-7-4 Error Code [5110] (YKMU)

1. Error code definition

Heatsink temperature sensor (THHS) fault (Detail code 01)

2. Error definition and error detection method

When a short or an open of THHS is detected just before or during the inverter operation.

3. Cause, check method and remedy

Cause		Check method and remedy
(1) I	NV board failure	If the problem recurs when the unit is put into operation, replace the INV board.

Note |

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-7-5 Error Codes [5111, 5112, 5115, 5116]

1. Error code definition

5111

Liquid inlet temperature sensor (TH11) fault (BC controller)

5112

Bypass outlet temperature sensor (TH12) fault (BC controller)

5115

LEV3 outlet temperature sensor (TH15) fault (BC controller)

5116

LEV3 inlet temperature sensor (TH16) fault (BC controller)

2. Error definition and error detection method

•If a shorted (high temperature intake) or open (low temperature intake) thermistor (TH11, TH12, TH15, or TH16) is detected during operation, the unit makes an error stop, and an error code "5111," "5112," "5115," or "5116" appears on the display.
•Detection of a short- or open-circuit as described above is suspended during the defrost cycle and for 3 minutes after the operation mode is changed.

	Cause	Check method and remedy
(1)	Thermistor failure	Check thermistor resistance.
(2)	Pinched lead wire	Check for pinched lead wire.
(3)	Torn wire coating	Check for wire coating.
(4)	A pin on the male connector is missing or contact failure	Check connector.
(5)	Disconnected wire	Check for wire.
(6)	Thermistor input circuit failure on the control board	Check the intake temperature of the sensor with the LED monitor. When the temperature is far different from the actual temperature, replace the control board.

<Reference>

	Short detection	Open detection
TH11	110 $^{\circ}$ C [230 $^{\circ}$ F] and above (0.4 k Ω)	-40 °C [-40 °F] and below (130 k Ω)
TH12	110 $^{\circ}\text{C}$ [230 $^{\circ}\text{F}$] and above (0.4 k $\Omega)$	-40 $^{\circ}\text{C}$ [-40 $^{\circ}\text{F}$] and below (130 k $_{\Omega})$
TH15	70 °C [158 °F] and above (0.4 k Ω)	-40 °C [-40 °F] and below (130 k Ω)
TH16	110 °C [230 °F] and above (0.4 k Ω)	-40 °C [-40 °F] and below (130 k Ω)

7-7-6 Error Code [5201]

1. Error code definition

High-pressure sensor fault (63HS1)

2. Error definition and error detection method

- •If the high pressure sensor detects 0.098MPa [14psi] or less during the operation, the outdoor unit stops once, turns to antirestart mode for 3 minutes, and restarts after 3 minutes when the detected high pressure sensor is 0.098MPa [14psi] or more. •If the high pressure sensor detects 0.098MPa [14psi] or less just before the restart, the outdoor unit makes an error stop, and
- the error code "5201" will appear.
- •During 3-minute antirestart mode, preliminary errors will be displayed on the LED display.
 •A error is not detected for 3 minutes after the compressor start, during defrost operation, or 3 minutes after defrost operation.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	High pressure sensor failure	Refer to the following page(s). [8-5-1 Comparing the High-Pressure Sensor Measurement and Gauge Pressure](page 267)
(2)	Pressure drop due to refrigerant leak	
(3)	Torn wire coating	
(4)	A pin on the male connector is missing or contact failure	
(5)	Disconnected wire	
(6)	High pressure sensor input circuit failure on the control board	

7-7-7 Error Codes [5201, 5203]

1. Error code definition

5201

High-pressure sensor fault (Outdoor unit 63HS1/BC controller PS1)

5203

Intermediate pressure sensor fault (BC controller PS3)

2. Error definition and error detection method

When a pressure sensor reading of 4.06 MPa [589 psi] or above is detected, error codes "5201" and "5203" will appear. The unit will continue its operation by using other sensors as a backup.

	Cause	Check method and remedy
(1)	High pressure sensor failure	Refer to the following page(s). [8-5-1 Comparing the High-Pressure Sensor Measurement and Gauge Pressure](page 267)
(2)	Pressure drop due to refrigerant leak	
(3)	Torn wire coating	
(4)	A pin on the male connector is missing or contact failure	
(5)	Disconnected wire	
(6)	High pressure sensor input circuit failure on the control board	

7-7-8 Error Code [5301] Detail Code 115 (TKMU)

1. Error code definition

ACCT sensor fault (Detail code 115)

2. Error definition and error detection method

When the formula "output current < 2 Arms" remains satisfied for 10 seconds while the inverter is in operation.

3. Cause, check method and remedy

Cause		Check method and remedy	
(1)	Inverter open output phase	Check the output wiring connections.	
(2)	Compressor failure	Refer to the following page(s). [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290)	
(3)	INV board failure	Refer to the following page(s). [8-10-2 Checking the Inverter Board Error Detection Circuit](page 290) [8-10-4 Checking the Inverter for Damage at No-Load](page 290) [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291)	
(4)	Contact failure	Check the connection of the connector (CNCT2) on the INV boardINV board.	
(5)	ACCT sensor failure	Refer to the following page(s). [8-10-13 Simple Check on Inverter Circuit Components](page 295)	

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-7-9 Error Code [5301] Detail Code 115 (YKMU)

1. Error code definition

ACCT sensor fault (Detail code 115)

2. Error definition and error detection method

When the formula "output current < 1.5 Arms" remains satisfied for 10 seconds while the inverter is in operation.

3. Cause, check method and remedy

Cause		Check method and remedy
(1)	Inverter open output phase	Check the output wiring connections.
(2)	Compressor failure	Refer to the following page(s). [8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 300)
(3)	INV board failure	Refer to the following page(s). [8-11-2 Checking the Inverter Board Error Detection Circuit](page 300) [8-11-4 Checking the Inverter for Damage at No-Load](page 300) [8-11-5 Checking the Inverter for Damage during Compressor Operation](page 301)

Note

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-7-10 Error Code [5301] Detail Code 116 (TKMU)

1. Error code definition

DCCT sensor fault (Detail code116)

2. Error definition and error detection method

When the bus current less than 18 Apeak is detected at startup (6Hz)

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Contact failure	Check the contact of the connector (CNCT) on the INV board, and the contact the connector on DCCT side.
(2)	Misorientation	Check the installation direction of DCCT.
(3)	DCCT sensor failure	Replace the DCCT sensor.
(4)	INV board failure	Replace the INV board.

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-7-11 Error Code [5301] Detail Code 117

1. Error code definition

ACCT sensor circuit fault (Detail code 117)

2. Error definition and error detection method

When an error value is detected with the ACCT detection circuit just before the inverter starts

3. Cause, check method and remedy

Cause		Check method and remedy
(1)	INV board failure	Refer to the following page(s). (TKMU) [8-10-2 Checking the Inverter Board Error Detection Circuit](page 290) [8-10-4 Checking the Inverter for Damage at No-Load](page 290) [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291) (YKMU) [8-11-2 Checking the Inverter Board Error Detection Circuit](page 300) [8-11-4 Checking the Inverter for Damage at No-Load](page 300) [8-11-5 Checking the Inverter for Damage during Compressor Operation](page 301)
(2)	Compressor failure	Refer to the following page(s). (TKMU) [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290) (YKMU) [8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 300)

Note

For inverter-related error codes, refer to the following page(s).

[8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

[8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-7-12 Error Code [5301] Detail Code 118 (TKMU)

1. Error code definition

DCCT sensor circuit fault (Detail code118)

2. Error definition and error detection method

When an error value is detected with the DCCT detection circuit just before the inverter starts

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Contact failure	Check for good contact of the INV board connector CNCT and the connector on the DCCT side.
(2)	INV board failure	Refer to the following page(s). [8-10-2 Checking the Inverter Board Error Detection Circuit](page 290) [8-10-4 Checking the Inverter for Damage at No-Load](page 290) [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291)
(3)	DCCT sensor failure	Replace the DCCT sensor.
(4)	Compressor failure	Refer to the following page(s). [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290)
(5)	Inverter failure	Refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-7-13 Error Code [5301] Detail Code 119 (TKMU)

1. Error code definition

Open-circuited IPM/Loose ACCT connector (Detail code 119)

2. Error definition and error detection method

Presence of enough current cannot be detected during the self-diagnostic operation immediately before inverter startup.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	ACCT sensor disconnection	Check the connection of the connector (CNCT2) on the INV board. Check for proper mounting of ACCT.
(2)	ACCT sensor failure	Refer to the following page(s). [8-10-13 Simple Check on Inverter Circuit Components](page 295)
(3)	Inverter failure	Refer to the following page(s). [8-10-4 Checking the Inverter for Damage at No-Load](page 290) [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291)
(4)	Compressor failure	Refer to the following page(s). [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290)

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-7-14 Error Code [5301] Detail Code 119 (YKMU)

1. Error code definition

Open-circuited IPM/Loose ACCT connector (Detail code 119)

2. Error definition and error detection method

Presence of enough current cannot be detected during the self-diagnostic operation immediately before inverter startup.

3. Cause, check method and remedy

	Cause	Check method and remedy	
(1)	Inverter output wiring problem	Check output wiring connections. Confirm that the U- and W-phase output cables are put through CT12 and CT22 on the INV board respectively.	
(2)	Inverter failure	Refer to the following page(s). [8-11-4 Checking the Inverter for Damage at No-Load](page 300) [8-11-5 Checking the Inverter for Damage during Compressor Operation](page 301)	
(3)	Compressor failure	Refer to the following page(s). [8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 300)	

Note

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-7-15 Error Code [5301] Detail Code 120 (TKMU)

1. Error code definition

Faulty ACCT wiring (Detail code 120)

2. Error definition and error detection method

Presence of target current cannot be detected during the self-diagnostic operation immediately before startup. (Detection of improperly mounted ACCT sensor)

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Wrongly mounted ACCT sensor	Check for proper mounting of ACCT.[8-10-13 Simple Check on Inverter Circuit Components](page 295)
(2)	ACCT sensor failure	[8-10-13 Simple Check on Inverter Circuit Components](page 295)
(3)	Inverter failure	Refer to the following page(s). [8-10-4 Checking the Inverter for Damage at No-Load](page 290) [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291)
(4)	Compressor failure	Refer to the following page(s). [8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 290)

Note

For inverter-related error codes, refer to the following page(s). [8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

7-7-16 Error Code [5301] Detail Code 120 (YKMU)

1. Error code definition

Faulty ACCT wiring (Detail code 120)

2. Error definition and error detection method

Presence of target current cannot be detected during the self-diagnostic operation immediately before startup.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Inverter output wiring problem	Check output wiring connections. Confirm that the U- and W-phase output cables are put through CT12 and CT22 on the INV board respectively.
(2)	Inverter failure	Refer to the following page(s). [8-11-4 Checking the Inverter for Damage at No-Load](page 300) [8-11-5 Checking the Inverter for Damage during Compressor Operation](page 301)
(3)	Compressor failure	Refer to the following page(s). [8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems](page 300)

Note

For inverter-related error codes, refer to the following page(s). [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-7-17 Error Codes [5305] Detail Code 132

1. Error code definition

Position detection error at startup (Detail code 132)

2. Error definition and error detection method

When a motor sensor has detected an error within 10 seconds after the fan motor has gone into operation.

3. Cause, check method and remedy

	Cause	Check method and remedy		
(1) Contact failure and faulty fan motor wiring Check the fan board connector CNINV and CNSNR for proper Check the wirign betweem the fan motor and fan board.		Check the fan board connector CNINV and CNSNR for proper contacts. Check the wirign betweem the fan motor and fan board.		
(2)	Fan board failure	Refer to the following page(s). (TKMU) [8-10-9 Checking the Fan Inverter for Damage with Load](page 293) (YKMU) [8-11-9 Checking the Fan Inverter for Damage with Load](page 303)		
(3)	Fan motor error	Refer to the following page(s). (TKMU) [8-10-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 291) (YKMU) [8-11-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 301)		

Note

For inverter-related error codes, refer to the following page(s).

[8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

[8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-7-18 Error Codes [5305] Detail Code 133

1. Error code definition

Position detection error during operation (Detail code 133)

2. Error definition and error detection method

An error from a motor sensor is detected during fan moter operation.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Outdoor factors	Check that there is no wind (gust or strong wind).
(2)	Contact failure and faulty fan motor wiring	Check the fan board connector CNINV and CNSNR for proper contacts. Check the wirign betweem the fan motor and fan board.
(3)	Fan board failure	Refer to the following page(s). (TKMU) [8-10-8 Checking the Fan Inverter for Damage at No Load](page 292) [8-10-9 Checking the Fan Inverter for Damage with Load](page 293) (YKMU) [8-11-8 Checking the Fan Inverter for Damage at No Load](page 302) [8-11-9 Checking the Fan Inverter for Damage with Load](page 303)
(4)	Fan motor error	Refer to the following page(s). (TKMU) [8-10-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 291) (YKMU) [8-11-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 301)

Note

For inverter-related error codes, refer to the following page(s).

[8-10 Troubleshooting Inverter Problems (TKMU)](page 288)

[8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-7-19 Error Codes [5305] Detail Code 134

1. Error code definition

RPM error before start up (Detail code 134)

2. Error definition and error detection method

The fan RPM will not drop to the set RPM.

3. Cause, check method and remedy

Cause		Check method and remedy		
(1)	Outdoor factors	Check that there is no wind (gust or strong wind).		
(2)	Fan board failure	Refer to the following page(s). (TKMU) [8-10-8 Checking the Fan Inverter for Damage at No Load](page 292) [8-10-9 Checking the Fan Inverter for Damage with Load](page 293) (YKMU) [8-11-8 Checking the Fan Inverter for Damage at No Load](page 302) [8-11-9 Checking the Fan Inverter for Damage with Load](page 303)		
(3)	Fan motor error	Refer to the following page(s). (TKMU) [8-10-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 291) (YKMU) [8-11-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 301)		

Note

For inverter-related error codes, refer to the following page(s).

[8-10 Troubleshooting Inverter Problems (TKMU)](page 288) [8-11 Troubleshooting Inverter Problems (YKMU)](page 298)

7-7-20 Error Code [5401]

1. Error Code

5401

Humidity sensor fault

2. Error definition and error detection method

•A short-circuit or an open-circuit of the humidity sensor is detected during operation.

	Cause		Check method and remedy
(1)	Connector contact failure (CN30) (Loose connector)	1)	Check the connector for proper contact. Reconnect the connector, and operate the unit to check for proper operation.
(2)	Broken or partially broken humidity sensor wire	2)	Check for broken humidity sensor wire.
(3)	Humidity sensor fault	3)	Check the output voltage across No. 1 and No. 3 pins of connector CN30 with the connector being connected to the indoor unit control board. 30%: 1.25V 40%: 1.52V 50%: 1.88V 60%: 2.19V 70%: 2.48V 80%: 2.79V
(4)	Indoor unit control board (detection circuit) fault	4)	If the above items check out okay, replace the indoor unit control board.

7-7-21 Error Code [5402]

1. Error code definition

Outside humidity sensor fault

2. Error definition and error detection method

Humidity sensor fault or built-in temperature sensor fault

3. Cause, check method and remedy

- 1) Check the connector CN22 on the circuit board for proper connection.
- 2) Check the outside humidity sensor and relay cable for proper connection.
- 3) Check the output voltage across 2P and 4P of the humidity sensor (CN22).

Conversion of relative humidity to humidity sensor output voltage

20%RH: 1. 2 V or below

40%RH: 1.7V

60%RH: 2.2V

80%RH: 2.7V

Replace the outside humidity sensor if there is a large discrepancy between ambient humidity and the humidity temperature sensor output voltage.

4) Disconnect the connector CN22 on the circuit board, and check the resistance between 3P and 4P (thermistor resistance of the built-in temperature sensor)

Conversion of temperature to sensor resistance

0°C: 169kΩ 20°C: 63kΩ 40°C:26kΩ

Replace the outside humidity sensor if there is a large discrepancy between ambient temperature and thermistor resistance.

→ If replacing the sensor does not resolve the problem, resolve the circuit board.

7-7-22 Error Code [5403]

1. Error code definition

Aging degradation of outside humidity sensor

2. Error definition and error detection method

The life of the humidity sensor has expired, and humidity cannot be detected correctly.

3. Cause, check method and remedy

1) Replace the outside humidity sensor.

After replacing the outside humidity sensor, press and hold the maintenance reset switch (SW22) for 5 seconds or longer until the maintenance reset indication LED2 (green) starts blinking.

→ If replacing the sensor does not resolve the problem, resolve the circuit board.

7-7-23 Error Code [5701]

1. Error code definition

Loose float switch connector

2. Error definition and error detection method

Detection of the disconnected float switch (open-phase condition) during operation

3. Cause, check method and remedy

(1) CN4F disconnection or contact failure

Check for disconnection of the connector (CN4F) on the indoor unit control board.

7-8 Error Code Definitions and Solutions: Codes [6000 - 6999]

7-8-1 Error Code [6201]

1. Error code definition

Remote controller board fault (nonvolatile memory error)

2. Error definition and error detection method

This error is detected when the data cannot be read out from the built-in nonvolatile memory on the remote controller.

3. Cause, check method and remedy

(1) Remote controller failure

Replace the remote controller.

7-8-2 Error Code [6202]

1. Error code definition

Remote controller board fault (clock IC error)

2. Error definition and error detection method

This error is detected when the built-in clock on the remote controller is not properly functioning.

3. Cause, check method and remedy

(1) Remote controller failure

Replace the remote controller.

7-8-3 Error Code [6600]

1. Error code definition Address overlaps

2. Error definition and error detection method

An error in which signals from more than one indoor units with the same address are received

Note

The address and attribute that appear on the remote controller indicate the controller that detected the error.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	Two or more of the following have the same address: Outdoor units, BC controllers, indoor units, LOSSNAY	•Find the unit that has the same address as that of the error source.
	units, controllers such as ME remote controllers. <example> 6600 "01" appears on the remote controller Unit #01 detected the error.</example>	Once the unit is found, correct the address. Then, turn off the outdoor units, indoor units, BC controllers, and LOSSNAY units, keep them all turned off for at least five minutes, and turn them back on.
	Two or more units in the system have 01 as their address.	When air conditioning units are operating normally despite the address overlap error
(2)	Signals are distorted by the noise on the transmission line.	Check the transmission wave shape and noise on the transmission line. See the section "Investigation of Transmission Wave Shape/Noise."

7-8-4 Error Code [6601]

1. Error code definition Polarity setting error

2. Error definition and error detection method

The error detected when transmission processor cannot distinguish the polarities of the M-NET transmission line.

	Cause	Check method and remedy
(1)	No voltage is applied to the M-NET transmission line that AG-150A/GB-50ADA/PAC-YG50ECA/BAC-HD150 are connected to.	Check if power is supplied to the M-NET transmission line of the AG-150A/GB-50ADA/PAC-YG50ECA/BAC-HD150, and correct any problem found.
(2)	M-NET transmission line to which AG-150A/GB-50ADA/PAC-YG50ECA/BAC-HD150 are connected is short-circuited.	

7-8-5 Error Code [6602]

1. Error code definition

Transmission processor hardware error

2. Error definition and error detection method

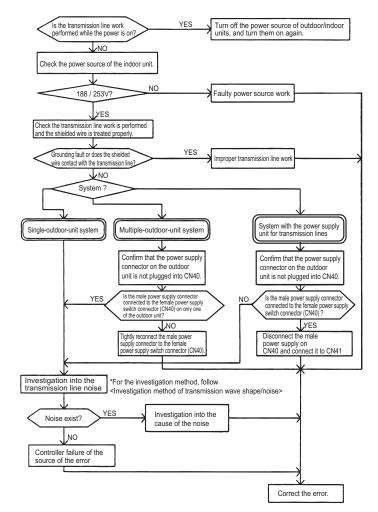
Although "0" was surely transmitted by the transmission processor, "1" is displayed on the transmission line.

Note

The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.

3. Cause

- 1) When the wiring work of or the polarity of either the indoor or outdoor transmission line is performed or is changed while the power is on, the transmitted data will collide, the wave shape will be changed, and an error will be detected.
- 2) Grounding fault of the transmission line
- 3) When grouping the indoor units that are connected to different outdoor units, the male power supply connectors on the multiple outdoor units are connected to the female power supply switch connector (CN40).
- 4) When the power supply unit for transmission lines is used in the system connected with MELANS, the male power supply connector is connected to the female power supply switch connector (CN40) on the outdoor unit.
- 5) Controller failure of the source of the error
- 6) When the transmission data is changed due to the noise on the transmission line
- 7) Voltage is not applied on the transmission line for centralized control (in case of grouped indoor units connected to different outdoor units or in case of the system connected with MELANS)



7-8-6 Error Code [6603]

1. Error code definition

Transmission line bus busy error

2. Error definition and error detection method

- •Generated error when the command cannot be transmitted for 4-10 minutes in a row due to bus-busy
- •Generated error when the command cannot be transmitted to the transmission line for 4-10 minutes in a row due to noise

Note

The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.

3. Cause, check method and remedy

	Cause	Check method and remedy
(1)	The transmission processor cannot be transmitted as the short-wavelength voltage like noise exists consecutively on the transmission line.	 Check the transmission wave shape and noise on the transmission line. See the section "Investigation of Transmission Wave Shape/Noise." → No noise indicates that the error source controller is a failure. → If noise exists, investigate the noise.
(2)	Error source controller failure	

7-8-7 Error Code [6606]

1. Error code definition

Communication error between device and transmission processors

2. Error definition and error detection method

Communication error between the main microcomputer on the indoor unit board and the microcomputer for transmission

Note

The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred.

	Cause	Check method and remedy
(1)	Data is not properly transmitted due to accidental erroneous operation of the controller of the error source.	Turn off the power source of the outdoor and the indoor units. (When the power source is turned off separately, the microcomputer will not be reset, and the error will not be
(2)	Error source controller failure	corrected.) → If the same error occurs, the error source controller is a failure.

7-8-8 Error Code [6607] Error Source Address = Outdoor Unit (OC)

1. Error code definition No ACK error

2. Error definition and error detection method

The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)

Note

The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).

3. Cause, check method and remedy

	Cause		Check method and remedy
(1)	Incidental cause	1)	Turn off the power source of the outdoor unit, and turn it on again.
(2)	Contact failure of transmission line of OC or IC	2)	If the error is accidental, it will run normally. If not,
(3)	Decrease of transmission line voltage/signal by exceeding acceptable range of transmission wiring. Farthest: 200 m [656ft] or less Remote controller wiring: 10m [32ft] or less		check the causes (2) - (5).
(4)	Erroneous sizing of transmission line (Not within the range below). Wire diameter: 1.25mm ² [AWG16] or more		
(5)	Outdoor unit control board failure		

7-8-9 Error Code [6607] Error Source Address = BC Controller (BC)

1. Error code definition No ACK error

2. Error definition and error detection method

The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)

Note

The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).

	Cause		Check method and remedy	
(1)	Incidental cause	1)	Turn off the power to the outdoor unit and the BC controller, leave them turned off for at least 5 minutes, and then turn them back on.	
(2)	When BC controller address is changed or modified during operation.	2)	If the error is accidental, it will run normally. If not, check the causes (2) - (5).	
(3)	Faulty or disconnected transmission wiring of BC controller			
(4)	Disconnected connector of BC controller (CN02)			
(5)	Faulty control board of BC controller			

7-8-10 Error Code [6607] Error Source Address = Indoor Unit (IC)

1. Error code definition

No ACK error

2. Error definition and error detection method

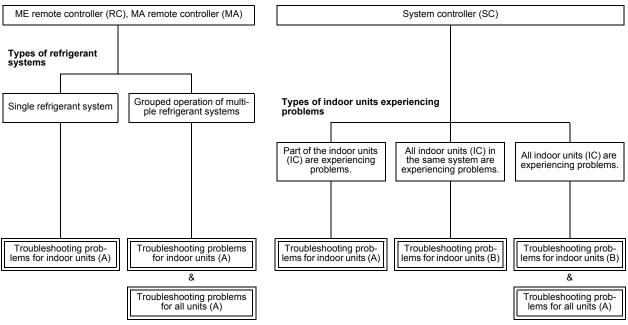
The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)

Note

The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).

3. Cause, check method and remedy

Error display



(1) Troubleshooting problems for indoor units (A)

	Cause		Check method and remedy
(1)	Incidental cause	1)	Turn off the outdoor/indoor units for 5 or more minutes, and turn them on again.
(2)	When IC unit address is changed or modified during operation.	2)	If the error is accidental, it will run normally. If not, check the causes (2) - (6).
(3)	Faulty or disconnected IC transmission wiring		
(4)	Disconnected IC connector (CN2M)		
(5)	Indoor unit controller failure		
(6)	ME remote controller failure		

(2) Troubleshooting problems for indoor units (B)

	Cause	Check method and remedy
(1)	When the power supply unit for transmission lines is used and the male power supply connector is connected to the female power supply switch connector (CN40) for the transmission line for centralized control	Check voltage of the transmission line for centralized control. •20 V or more: Check (1) on the left. •Less than 20 V: Check (2) on the left.
(2)	Disconnection or shutdown of the power source of the power supply unit for transmission line	
(3)	System controller (MELANS) malfunction	

7-8-11 Error Code [6607] Error Source Address = LOSSNAY (LC)

1. Error code definition No ACK error

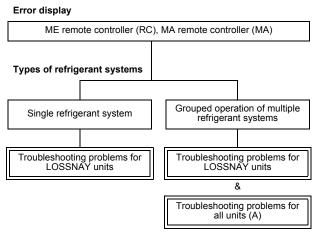
2. Error definition and error detection method

The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)

Note

The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).

3. Cause, check method and remedy



(1) Troubleshooting problems for LOSSNAY units

	Cause	Check method and remedy			
(1)	Incidental cause	1)	Turn off the power source of LOSSNAY and turn it on again.		
(2)	The power source of LOSSNAY has been shut off.	2)	If the error is accidental, it will run normally.		
(3)	When the address of LOSSNAY is changed in the middle of the operation		If not, check the causes (2) - (6).		
(4)	Faulty or disconnected transmission wiring of LOSSNAY				
(5)	Disconnected connector (CN1) on LOSSNAY				
(6)	Controller failure of LOSSNAY				

7-8-12 Error Code [6607] Error Source Address = ME Remote Controller

1. Error code definition No ACK error

2. Error definition and error detection method

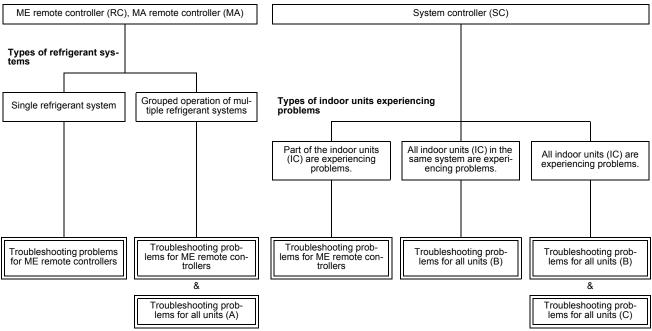
The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)

Note

The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).

3. Cause, check method and remedy

Error display



(1) Troubleshooting problems for ME remote controllers

	Cause	Check method and remedy				
(1)	Incidental cause	1)	Turn off the power source of the outdoor unit for 5 minutes or more, and turn it on again.			
(2)	Faulty transmission wiring at IC unit side.	2)	If not, check the causes (2) - (5).			
(3)	Faulty wiring of the transmission line for ME remote controller					
(4)	When the address of ME remote controller is changed in the middle of the operation					
(5)	ME remote controller failure					

7-8-13 Error Code [6607] Error Source Address = System Controller

1. Error code definition No ACK error

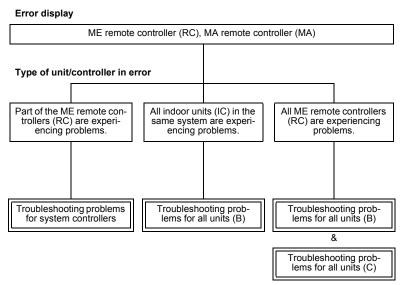
2. Error definition and error detection method

The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)

Note |

The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).

3. Cause, check method and remedy



(1) Troubleshooting problems for system controllers

	Cause	Check method and remedy			
(1)	Incidental cause	1)	Turn off the power source of the outdoor unit for 5 minutes or more, and turn it on again.		
(2)	Faulty wiring of the transmission line for ME remote controller	2)	If not, check the causes (2) - (4).		
(3)	When the address of ME remote controller is changed in the middle of the operation				
(4)	ME remote controller failure				

7-8-14 Error Code [6607] All Error Source Addresses

1. Error code definition No ACK error

2. Error definition and error detection method

The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)

Note

The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).

3. Cause, check method and remedy

(1) Troubleshooting problems for all units (A)

	Cause	Check method and remedy			
(1)	Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized con- trol line connection (TB7)	1)	Check the causes of (1) - (4). If the cause is found, correct it. If no cause is found, check 2).		
(2)	When multiple outdoor units are connected and the power source of one of the outdoor units has been shut off.	2)	Check the LED displays for troubleshooting on other remote controllers whether an error occurs.		
(3)	The male power supply connector of the outdoor unit is not connected to the female power supply switch connector (CN40).		 When an error is present Check the causes of the error indicated by the error codes listed in item (4) in the "Cause" col- 		
(4)	The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for centralized control.		umn. •When no errors are present Indoor unit circuit board failure		
	If an error occurs, after the unit runs normally once, the following causes may be considered. •Total capacity error (7100) •Capacity code error (7101) •Error in the number of connected units (7102) •Address setting error (7105)				

(2) Troubleshooting problems for all units (B)

	Cause	Check method and remedy			
(1)	Total capacity error (7100)	1)	Check the LED display for troubleshooting on the		
(2)	Capacity code error (7101)		outdoor unit. •When an error is present		
(3)	Error in the number of connected units (7102)		Check the causes of the error indicated by the		
(4)	Address setting error (7105)		error codes listed in items (1) through (4) in the "Cause" column.		
(5)	Disconnection or short circuit of the transmission line for the outdoor unit on the terminal block for centralized con- trol line connection (TB7)		•When no errors are present Check the causes of the error indicated by the error codes listed in items (5) through (7) in the		
(6)	Turn off the power source of the outdoor unit		"Cause" column.		
(7)	Malfunction of electrical system for the outdoor unit				

(3) Troubleshooting problems for all units (C)

	Cause	Check method and remedy				
(1)	When the power supply unit for transmission lines is used and the male power supply connector is connected to the female power supply switch connector (CN40) for the transmission line for centralized control	Check the causes of the error indicated by the error codes listed in items (1) through (3) in the "Cause" column.				
(2)	Disconnection or shutdown of the power source of the power supply unit for transmission line					
(3)	System controller (MELANS) malfunction					

7-8-15 Error Code [6607] No Error Source Address

1. Error code definition No ACK error

2. Error definition and error detection method

The error is detected when no acknowledgement (ACK signal) is received after the transmission. (eg. When the data is transmitted six times in a row with 30 seconds interval, the error is detected on the transmission side.)

Note

The address/attribute appeared on the display on the remote controller indicates the controller which did not provide the response (ACK).

	Cause		Check method and remedy
(1)	Although the address of ME remote controller has been changed after the group is set using ME remote controller, the indoor unit is keeping the memory of the previous address. The same symptom will appear for the registration with SC.		Delete unnecessary information of non-existing address which some indoor units have. Use either of the following two methods for deletion.
(2)	Although the address of LOSSNAY has been changed after the interlock registration of LOSSNAY is made using ME remote controller, the indoor unit is keeping the memory of the previous address.	1)	Address deletion by ME remote controller Delete unnecessary address information using the manual setting function of ME remote controller. For details, refer to the following page(s). [6-3-4 Address Deletion](page 154)
		2)	Deletion of connection information of the outdoor unit by the deleting switch
			Note that the above method will delete all the group settings set via the ME remote controller and all the interlock settings between LOSSNAY units and indoor units.
			 Procedures Turn off the power source of the outdoor unit, and wait for 5 minutes. Turn on the dip switch (SW5-2) on the outdoor unit control board. Turn on the power source of the outdoor unit, and wait for 5 minutes. Turn off the power source of the outdoor unit, and wait for 5 minutes. Turn off the dip switch (SW5-2) on the outdoor unit control board. Turn on the power source of the outdoor unit.

7-8-16 Error Code [6608]

1. Error code definition

No response error

2. Error definition and error detection method

- •When no response command is returned although acknowledgement (ACK) is received after transmission, an error is detected.
- •When the data is transmitted 10 times in a row with 3 seconds interval, an error is detected on the transmission side.

Note

The address/attribute appeared on the display on the remote controller indicates the controller where an error occurred

3. Cause

- The transmission line work is performed while the power is on, the transmitted data will collide, and the wave shape will be changed.
- 2) The transmission is sent and received repeatedly due to noise.
- 3) Decrease of transmission line voltage/signal by exceeding acceptable range of transmission wiring.

Farthest:200m [656ft] or less

Remote controller wiring:12m [39ft] or less

4) The transmission line voltage/signal is decreased due to erroneous sizing of transmission line.

Wire diameter: 1.25mm²[AWG16] or more

4. Check method and remedy

- 1) When an error occurs during commissioning, turn off the power sources for the outdoor unit, indoor unit, BC controller, and LOSSNAY for 5 or more minutes, and then turn them on again.
 - When they return to normal operation, the cause of the error is the transmission line work performed with the power on.
 - *If an error occurs again, check the cause 2).
- 2) Check 3) and 4) above.
 - •If the cause is found, correct it.
 - If no cause is found, check 3).
- (1) Check the transmission waveform, and check the transmission line for electrical noise. For details, refer to the following page(s). [8-4 Checking Transmission Waveform and for Electrical Noise Interference](page 264)

Noise is the most possible cause of the error "6608".

7-8-17 Error Code [6831]

1. Error code definition

MA controller signal reception error (No signal reception)

2. Error definition and error detection method

- *Communication between the MA remote controller and the indoor unit is not done properly.
- •No proper data has been received for 3 minutes.

3. Cause

- 1) Contact failure of the remote controller lines of MA remote controller or the indoor unit.
- 2) All the remote controllers are set to SUB.
- 3) Failure to meet wiring regulations
 - •Wire length
 - •Wire size
 - Number of remote controllers
 - Number of indoor units
- 4) The remote controller is removed after the installation without turning the power source off.
- 5) Noise interference on the remote controller transmission lines
- 6) Faulty circuit that is on the indoor board and performs transmission/ reception of the signal from the remote controller
- 7) Problems with the circuit on the remote controller that sends or receives the signals from the remote controller

- 1) Check for disconnected or loose transmission lines for the indoor units or MA remote controllers.
- 2) Confirm that the power is supplied to the main power source and the remote controller line.
- 3) Confirm that MA remote controller's capacity limit is not exceeded.
- 4) Check the sub/main setting of the MA remote controllers. One of them must be set to MAIN.
- 5) Diagnose the remote controller (described in the remote controller installation manual).
 - [OK]: no problems with the remote controller (check the wiring regulations)
 - [NG]: Replace the MA remote controller.
 - [6832, 6833, ERC]: Due to noise interference <Go to 6)>
- 6) Check the transmission waveform, and check the MA remote controller line for electrical noise. For details, refer to the following page(s). [8-4 Checking Transmission Waveform and for Electrical Noise Interference](page 264)
- 7) When no problems are found with items 1) through 6), replace the indoor unit board or the MA remote controller. The following status can be confirmed on LED1 and 2 on the indoor unit board.
 - If LED1 is lit, the main power source of the indoor unit is turned on.
 - •If LED2 is lit, the MA remote controller line is being powered.

7-8-18 Error Code [6832]

1. Error code definition

MA remote controller signal transmission error (Synchronization error)

2. Error definition and error detection method

- •MA remote controller and the indoor unit is not done properly.
- Failure to detect opening in the transmission path and unable to send signals
 - *Indoor unit: 3 minutes
 - *Remote controller: 6 seconds

3. Cause

- 1) Contact failure of the remote controller lines of MA remote controller or the indoor unit
- 2) 2 or more remote controllers are set to MAIN
- 3) Overlapped indoor unit address
- 4) Noise interference on the remote controller lines
- 5) Failure to meet wiring regulations
 - ·Wire length
 - Wire size
 - Number of remote controllers
 - Number of indoor units
- 6) Problems with the circuit on the remote controller that sends or receives the signals from the remote controller

- 1) Check for disconnected or loose transmission lines for the indoor units or MA remote controllers.
- 2) Confirm that the power is supplied to the main power source and the remote controller line.
- 3) Confirm that MA remote controller's capacity limit is not exceeded.
- 4) Check the sub/main setting of the MA remote controllers. One of them must be set to MAIN.
- 5) Diagnose the remote controller (described in the remote controller installation manual).
 - [OK]: no problems with the remote controller (check the wiring regulations)
 - [NG]: Replace the MA remote controller.
 - [6832, 6833, ERC]: Due to noise interference <Go to 6)>
- 6) Check the transmission waveform, and check the MA remote controller line for electrical noise. For details, refer to the following page(s). [8-4 Checking Transmission Waveform and for Electrical Noise Interference](page 264)
- 7) When no problems are found with items 1) through 6), replace the indoor unit board or the MA remote controller. The following status can be confirmed on LED1 and 2 on the indoor unit board.
 - •If LED1 is lit, the main power source of the indoor unit is turned on.
 - •If LED2 is lit, the MA remote controller line is being powered.

7-8-19 Error Code [6833]

1. Error code definition

MA remote controller signal transmission error (Hardware error)

2. Error definition and error detection method

- *Communication between the MA remote controller and the indoor unit is not done properly.
- •An error occurs when the transmitted data and the received data differ for 30 times in a row.

3. Cause

- 1) Contact failure of the remote controller lines of MA remote controller or the indoor unit
- 2) 2 or more remote controllers are set to MAIN
- 3) Overlapped indoor unit address
- 4) Noise interference on the remote controller lines
- 5) Failure to meet wiring regulations
 - Wire length
 - ·Wire size
 - Number of remote controllers
 - Number of indoor units
- 6) Problems with the circuit on the remote controller that sends or receives the signals from the remote controller

- 1) Check for disconnected or loose transmission lines for the indoor units or MA remote controllers.
- 2) Confirm that the power is supplied to the main power source and the remote controller line.
- 3) Confirm that MA remote controller's capacity limit is not exceeded.
- 4) Check the sub/main setting of the MA remote controllers. One of them must be set to MAIN.
- 5) Diagnose the remote controller (described in the remote controller installation manual).
 - [OK]: no problems with the remote controller (check the wiring regulations)
 - [NG]: Replace the MA remote controller.
 - [6832, 6833, ERC]: Due to noise interference <Go to 6)>
- 6) Check the transmission waveform, and check the MA remote controller line for electrical noise. For details, refer to the following page(s). [8-4 Checking Transmission Waveform and for Electrical Noise Interference](page 264)
- 7) When no problems are found with items 1) through 6), replace the indoor unit board or the MA remote controller. The following status can be confirmed on LED1 and 2 on the indoor unit board.
 - •If LED1 is lit, the main power source of the indoor unit is turned on.
 - •If LED2 is lit, the MA remote controller line is being powered.

7-8-20 Error Code [6834]

1. Error code definition

MA controller signal reception error (Start bit detection error)

2. Error definition and error detection method

- *Communication between the MA remote controller and the indoor unit is not done properly.
- •No proper data has been received for 2 minutes.

3. Cause

- 1) Contact failure of the remote controller lines of MA remote controller or the indoor unit.
- 2) All the remote controllers are set to SUB.
- 3) Failure to meet wiring regulations
 - •Wire length
 - •Wire size
 - Number of remote controllers
 - Number of indoor units
- 4) The remote controller is removed after the installation without turning the power source off.
- 5) Noise interference on the remote controller transmission lines
- 6) Faulty circuit that is on the indoor board and performs transmission/ reception of the signal from the remote controller
- 7) Problems with the circuit on the remote controller that sends or receives the signals from the remote controller

- 1) Check for disconnected or loose transmission lines for the indoor units or MA remote controllers.
- 2) Confirm that the power is supplied to the main power source and the remote controller line.
- 3) Confirm that MA remote controller's capacity limit is not exceeded.
- 4) Check the sub/main setting of the MA remote controllers. One of them must be set to MAIN.
- 5) Diagnose the remote controller (described in the remote controller installation manual).
 - [OK]: no problems with the remote controller (check the wiring regulations)
 - [NG]: Replace the MA remote controller.
 - [6832, 6833, ERC]: Due to noise interference <Go to 6)>
- 6) Check the transmission waveform, and check the MA remote controller line for electrical noise. For details, refer to the following page(s). [8-4 Checking Transmission Waveform and for Electrical Noise Interference](page 264)
- 7) When no problems are found with items 1) through 6), replace the indoor unit board or the MA remote controller. The following status can be confirmed on LED1 and 2 on the indoor unit board.
 - If LED1 is lit, the main power source of the indoor unit is turned on
 - •If LED2 is lit, the MA remote controller line is being powered.

7-9 Error Code Definitions and Solutions: Codes [7000 - 7999]

7-9-1 Error Code [7100]

1. Error code definition Total capacity error

2. Error definition and error detection method

The model total of indoor units in the system with one outdoor unit exceeds limitations.

3. Error source, cause, check method and remedy,

Error source		Cause							Check method and remedy		
Outdoor unit	(1)	tem v		total of indoor units in the syse outdoor unit exceeds the fole.					1)	Check the model total (capacity code total) of indoor units connected.	
									2)	Check the model name (capacity code) of the	
			Mode		Capa	acity to	otal			connected indoor unit set by the switch (SW2 on indoor unit board)	
			HP72 m	odel		108				indoor unit board).	
			HP96 m	odel		144				When the model name set by the switch is differ-	
			HP144 m	odel		216				ent from that of the unit connected, turn off the power source of the outdoor and the indoor units,	
			HP192 m	odel		288				and change the setting of the model name (ca-	
										pacity code).	
	(2) The model selection switches (SW5-3 - 5-6) on the outdoor unit are set incorrectly.								Check the setting for the model selection switch on the outdoor unit (Dipswitches SW5-3 - 5-6 on the outdoor unit control board).		
			Model		S۱	N5					
			Model	3	4	5	6				
			72 model	OFF	ON	OFF	OFF				
			96 model	ON	ON	OFF	OFF				
	(3) The outdoor unit and the auxiliary unit (OS) that is connected to the same system are not properly connected.					Confirm that the TB3 on the OC and OS are properly connected.					

7-9-2 Error Code [7101]

1. Error code definition Capacity code setting error

2. Error definition and error detection method

Connection of incompatible (wrong capacity code) indoor unit or outdoor unit

3. Error source, cause, check method and remedy

Error source	Cause								Check method and remedy
Outdoor unit Indoor unit	(1)	the switch (S *The capacity confirmed by	ame (capacity code) set by W2) is wrong. y of the indoor unit can be the self-diagnosis function ion) of the outdoor unit.					1)	Check the model name (capacity code) of the indoor unit which has the error source address set by the switch (SW2 on indoor unit board). When the model name set by the switch is different from that of the unit connected, turn off the power source of the outdoor and the indoor units, and change the setting of the capacity code.
Outdoor unit	(2)		election switches (SW5-3 - utdoor unit are set incor-						Check the setting for the model selection switch on the outdoor unit (Dipswitches SW5-3 - 5-6 on the outdoor unit control board).
	Model SW5								
		Model	3	4	5	6			
		72 model	OFF	ON	OFF	OFF			
		96 model	ON	ON	OFF	OFF			

7-9-3 Error Code [7102]

Error code definition
 Wrong number of connected units

2. Error definition and error detection method

The number of connected indoor units is "0" or exceeds the allowable value.

3. Error source, cause, check method and remedy

Error source		C	Cause		Check method and remedy
Outdoor unit	(1)	terminal block (TB3	nits connected to the outdoor) for indoor/ outdoor transmis- imitations described below.	1)	Check whether the number of units connected to the outdoor terminal block (TB3) for indoor/ outdoor transmission lines does not exceed the limitation. (See (1) and (2) on the left.)
		Number of units	Restriction on the number of units	2)	Check (2) - (3) on the left.
		Total number of indoor units	1 - 18 : HP72 model 1 - 24 : HP96 model 1 - 36 : HP144 model 1 - 48 : HP192 model	3)	Check whether the transmission line for the terminal block for centralized control (TB7) is not connected to the terminal block for the indoor/outdoor transmission line (TB3).
		Number of BC controllers	1 (HP72- HP144 models only)	4)	Check the setting for the model selection switch on the outdoor unit (Dipswitches
		Number of Main BC controllers	0 or 1		SW5-7 on the outdoor unit control board).
		Number of Sub BC controllers	0,1 or 2		
		Total number of LOSSNAY units (During auto address start-up only)	0 or 1		
		Total number of outdoor units	1 : HP72 - HP96 models		
			2 : HP144 - HP192 models		
	(2) Disconnected transi unit or BC controller	mission line from the outdoor		
	(3)		smission line oply, the following display will		
		 ME remote control Nothing appears of cause it is not pool MA remote control "HO" or "PLEASI 			
	(4)) The model selection door unit is set to O			
	(5)	Outdoor unit addres The outdoor units in not have sequential			
	(6) GA- or HA-type BC main BC controller t			

7-9-4 Error Code [7105]

1. Error code definition Address setting error

2. Error definition and error detection method

Erroneous setting of OC unit address Erroneous setting of BC controller address

3. Cause, check method and remedy

Error source	Cause	Check method and remedy
Outdoor unit BC controller	Erroneous setting of OC unit address The address of outdoor unit is not being set to 51 - 100. The address of BC controller is not set to 51 - 100.	Check that the outdoor unit and BC controller addresses are set to 00 or a number between 51 and 100. If the outdoor unit address is out of the valid range, reset the address with the power to the outdoor unit turned off. If the BC controller address is out of the valid range, reset the address with the power to both the outdoor unit and BC controller turned off.

7-9-5 Error Code [7106]

1. Error code definition Attribute setting error

2. Error definition and error detection method

Error source	Cause	Check method and remedy
-	A remote controller for use with indoor units, such as the MA remote controller, is connected to the OA processing unit whose attribute is FU.	To operate the OA processing unit directly via a remote controller for use with indoor units, such as the MA remote controller, set the DIP SW 3-1 on the OA processing unit to ON.
		Operation Method SW3-1
		Interlocked operation with the indoor unit OFF
		Direct operation via the MA remote controller ON

7-9-6 Error Code [7107]

1. Error code definition Port setting error

2. Error definition and error detection method

The port with wrong number is connected to the indoor unit. The model total connected to the port is greater than the specification.

Error source		Cause	Check method and remedy
BC controller	(1)	Model total of indoor units per each port or per each port merge is greater than the specification. Total port number Model total Single branching 54 2 branches merge 96	Before resetting the port number using the port number setting switch or the model using the model (capacity code) setting switch, turn off the power of the outdoor unit, the BC controller and the indoor unit.
	(2)	4 or more indoor units are connected to the same port.	
	(3)	When two ports are used, the port with the smaller number is not connected to the indoor unit.	
	(4)	For the address of the BC controller (Sub 1 or 2), 50 is not added to the smallest indoor unit address, which is connected to the BC controller (Sub1 or 2).	
	(5)	In the system to which multiple BC controllers are connected, the indoor unit address connected to the BC controller is not set as shown below. (i) The indoor unit address which is connected to the BC controller (main) (ii) The indoor unit address which is connected to the BC controller (Sub1) (iii) he indoor unit address which is connected to the BC controller (Sub2) Address setting (i)<(ii)<(iii) *(ii) and (iii) can be reversed.	
		Is there a BC controller (Sub)? NO Are 4 or more indoor units connected to the same port? NO Is the model total of indoor units connected to the same port greater than the item (1)? When two ports are used, Is the port with the smallest number connected to the indoor unit? NO When two ports are used, Is the port with the smallest number connected to the indoor unit? NO The wrong model (capacity code) is set indoor unit model (capacity code). Change the port No. Adjust the piping connection to the port.	For the address of the BC controller (Sub), is 50 added to the smallest indoor unit address, which is connected to the BC controller (Sub)? YES Change the BC controller (Sub)? VES Change the indoor unit, which is connected to the the BC controller (Main), smaller than that of the indoor, which is connected to the BC controller (Sub 1 or 2)? YES Is the address of the indoor unit, which is connected to the the BC controller (Sub 1 or 2)? YES NO Change the BC controller (Sub) address. NO Is the address of the indoor unit address or change the BC controller (Sub 1 or 2)? YES NO NO NO Change the indoor unit address or change the BC controller (Sub 1 or 2)? YES

7-9-7 Error Code [7110]

1. Error code definition

Connection information signal transmission/reception error

2. Error definition and error detection method

The given indoor unit is inoperable because it is not properly connected to the outdoor unit in the same system.

3. Error source, cause, check method and remedy

Error source		Cause		Check method and remedy
Outdoor unit	(1)	Power to the transmission booster is cut off.	1)	Confirm that the power to the transmission booster is not cut off by the booster being connected to the switch on the indoor unit. (The unit will not function properly unless the transmission booster is turned on.)
	(2)	Power resetting of the transmission booster and outdoor unit.		->Reset the power to the outdoor unit.
	(3)	Wiring failure between OC and OS	2)	Confirm that the TB3 on the OC and OS are properly connected.
	(4)	Broken wire between OC and OS.	3)	Check the model selection switch on the out-
	(5)	The model selection switch (SW5-7) on the outdoor unit is set to OFF. (Normally set to ON)		door unit (Dipswitch SW5-7 on the control board.).

7-9-8 Error Code [7111]

1. Error code definition

Remote controller sensor fault

2. Error definition and error detection method

This error occurs when the temperature data is not sent although the remote controller sensor is specified.

Error source	Cause	Check method and remedy
Indoor unit OA process- ing unit	The remote controller without the temperature sensor (the wireless remote controller or the ME compact remote controller (mounted type)) is used and the remote controller sensor for the indoor unit is specified. (SW1-1 is ON.)	Replace the remote controller with the one with built-in temperature sensor.

7-9-9 Error Code [7113]

Error code definition Function setting error (improper connection of CNTYP)

Error source		Cause		Check method and remedy	
Outdoor unit	(1)	Wiring fault	(De	etail code 15)	
	(2)	Loose connectors, short-circuit, contact failure	1)	Check the connector CNTYP5 on the control board for proper connection.	
			2)	Check the connector CNTYP4 on the control board for proper connection.	
			(De	etail code 14)	
	(3)	Incompatible control board and INV board (replacement	1)	Check the connector CNTYP4 on the control board for proper connection.	
		with a wrong circuit board)	2)	Check the connector CNTYP5 on the control board for proper connection.	
	(4)	DIP SW setting error on the	3)	Check the settings of SW5-3 through SW5-6 on the control board	
		control board	(De	etail code 12)	
			1)	Check the connector CNTYP2 on the control board for proper connection.	
			2)	Check the connector CNTYP5 on the control board for proper connection.	
			3)	Check the connector CNTYP4 on the control board for proper connection.	
			4)	Check the settings of SW5-3 through SW5-6 on the control board	
			(De	etail code 16)	
			1)	Check the connector CNTYP on the INV board for proper connection.	
			2)	Check the connector CNTYP5 on the control board for proper connection.	
			3)	Check the connector CNTYP4 on the control board for proper connection.	
			4)	Check the settings of SW5-3 through SW5-6 on the control board	
			5)	Check the wiring between the control board and INV board. Refer to the following page(s). [7-2-1 Error Code [0403]](page 179)	
			(De	etail code 0, 1, 5, 6)	
			1)	Check the wiring between the control board and INV board. Refer to the following page(s). [7-2-1 Error Code [0403]](page 179)	
			2)	Check the settings of SW5-3 through SW5-6 on the control board	
			3)	Check the connector CNTYP5 on the control board for proper connection.	
			4)	Check the connector CNTYP4 on the control board for proper connection.	
			(De	etail code Miscellaneous)	
				*If a set-model-name identification error occurs, check the detail code on the unit on which the error occurred. The detail code tha appears on other units will be different from the ones shown above.	

7-9-10 Error Code [7117]

1. Error code definition Model setting error

Error source		Cause		Check method and remedy
Outdoor unit	(1)	Wiring fault	(De	tail code 15)
	(2)	Loose connectors, short-circuit, contact failure	1)	Check the connector CNTYP5 on the control board for proper connection.
			2)	Check the connector CNTYP4 on the control board for proper connection.
			(De	tail code 14)
			1)	Check the connector CNTYP4 on the control board for proper connection.
			(De	tail code 12)
			1)	Check the connector CNTYP2 on the control board for proper connection.
			2)	Check the connector CNTYP5 on the control board for proper connection.
			(De	tail code 16)
			1)	Check the connector CNTYP on the INV board for proper connection.
			2)	Check the connector CNTYP5 on the control board for proper connection.
			3)	Check the connector CNTYP4 on the control board for proper connection.
			4)	Check the wiring between the control board and INV board. Refer to the following page(s). [7-2-1 Error Code [0403]](page 179)
			(De	tail code 0, 1, 5, 6)
			1)	Check the wiring between the control board and INV board. Refer to the following page(s). [7-2-1 Error Code [0403]](page 179)
			2)	Check the settings of SW5-3 through SW5-6 on the control board.
			3)	Check the connector CNTYP5 on the control board for proper connection.
			4)	Check the connector CNTYP4 on the control board for proper connection.
			(De	tail code Miscellaneous)
				*If a set-model-name identification error occurs, check the detail code on the unit on which the error occurred. The detail code that appears on other units will be dif- ferent from the ones shown above.

7-9-11 Error Code [7130]

1. Error code definition Incompatible unit combination

2. Error definition and error detection method

The check code will appear when the indoor units with different refrigerant systems are connected.

Error source	Cause	Check method and remedy
Outdoor unit	The connected indoor unit is for use with R22 or R407C. Incorrect type of indoor units are connected. The M-NET connection adapter is connected to the indoor unit system in a system in which the Slim Model (A control) of units are connected to the M-NET.	Check the connected indoor unit model. Check whether the connecting adapter for M-NET is not connected to the indoor unit. (Connect the connecting adapter for M-NET to the outdoor unit.)

Chapter 8 Troubleshooting Based on Observed Symptoms

8-1	MA Remote Controller Problems	
8-1-1	The LCD Does Not Light Up.	
8-1-2	The LCD Momentarily Lights Up and Then Goes Off.	
8-1-3	"HO" and "PLEASE WAIT" Do Not Go Off the Screen.	
8-1-4	Air Conditioning Units Do Not Operate When the ON Button Is Pressed.	
8-2	ME remote Controller Problems	
8-2-1	The LCD Does Not Light Up.	
8-2-2	The LCD Momentarily Lights Up and Then Goes Off.	
8-2-3	"HO" Does Not Go Off the Screen.	
8-2-4	"88" Appears on the LCD.	
8-3	Refrigerant Control Problems	
8-3-1	Units in the Cooling Mode Do Not Operate at Expected Capacity	
8-3-2	Units in the Heating Mode Do Not Operate at Expected Capacity.	
8-3-3	Outdoor Units Stop at Irregular Times.	263
8-4 8-4-1	Checking Transmission Waveform and for Electrical Noise Interference M-NET	
8-4-2	MA Remote Controller	
8-5 8-5-1	Pressure Sensor Circuit Configuration and Troubleshooting Pressure Sensor Problems Comparing the High-Pressure Sensor Measurement and Gauge Pressure	
8-5-2	High-Pressure Sensor Configuration (63HS1,PS1,PS3)	
8-5-3	Comparing the Low-Pressure Sensor Measurement and Gauge Pressure	
8-5-4	Low-Pressure Sensor Configuration (63LS)	
8-6	Troubleshooting Solenoid Valve Problems	
8-7	Troubleshooting Outdoor Unit Fan Problems	
8-8 8-8-1	Troubleshooting LEV Problems	
8-8-2	Possible Problems and Solutions	
8-8-3	Coil Removal Instructions	
8-9 8-9-1	Troubleshooting Problems with Major Components on BC Controller Pressure Sensor	
8-9-2	Temperature Sensor	
8-9-3	Troubleshooting Flowchart for LEVs	
8-9-4	Troubleshooting Flowchart for Solenoid Valves	
8-9-5	BC Controller Transformer	
8-10 8-10-1	Troubleshooting Inverter Problems (TKMU)	
8-10-2	Checking the Inverter Board Error Detection Circuit	
8-10-3	Checking the Compressor for Ground Fault and Coil Resistance Problems	
8-10-4	Checking the Inverter for Damage at No-Load	
8-10-5	Checking the Inverter for Damage during Compressor Operation	
8-10-6	Checking the Fan Motor for Ground Fault and Coil Resistance Problems	
	Checking the Fan Board Error Detection Circuit at No Load	
	Checking the Fan Inverter for Damage at No Load	
	Checking the Fan Inverter for Damage at No Load	
	Checking the Installation Conditions	
	Solutions for the Main No-Fuse Breaker Trip	
	2 Solutions for the Main Earth Leakage Breaker Trip	
0-10-12	. Columnio for the main Earth Ecanage Dieaner Thp	234

8-10-13	Simple Check on Inverter Circuit Components	295
8-10-14	Troubleshooting Problems with Intelligent Power Module	296
8-10-15	Troubleshooting Problems with Diode Stack	297
8-11	Troubleshooting Inverter Problems (YKMU)	
8-11-1	Inverter-Related Problems and Solutions	
8-11-2	Checking the Inverter Board Error Detection Circuit	300
8-11-3	Checking the Compressor for Ground Fault and Coil Resistance Problems	300
8-11-4	Checking the Inverter for Damage at No-Load	300
8-11-5	Checking the Inverter for Damage during Compressor Operation	301
8-11-6	Checking the Fan Motor for Ground Fault and Coil Resistance Problems	301
8-11-7	Checking the Fan Board Error Detection Circuit at No Load	301
8-11-8	Checking the Fan Inverter for Damage at No Load	302
8-11-9	Checking the Fan Inverter for Damage with Load	303
8-11-10	Checking the Installation Conditions	303
8-11-11	Solutions for the Main No-Fuse Breaker Trip	304
8-11-12	Solutions for the Main Earth Leakage Breaker Trip	304
8-11-13	Simple Check on Inverter Circuit Components	305
8-11-14	Troubleshooting Problems with IGBT Module	305
8-12	Control Circuit (TKMU)	307
8-12-1	Control Power Supply Function Block	307
8-12-2	Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit	308
8-13	Control Circuit (YKMU)	309
8-13-1	Control Power Supply Function Block	309
8-13-2	Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit	310
8-14	Measures for Refrigerant Leakage	311
8-15	Compressor Replacement Instructions	313
8-16	Solenoid Valve Block and Check Valve Replacement Instructions	315
8-17	BC Controller Maintenance Instructions	319
8-18	Troubleshooting Problems Using the LED Status Indicators on the Outdoor Unit	322

8-1 MA Remote Controller Problems

8-1-1 The LCD Does Not Light Up.

1. Phenomena

Even if the operation button on the remote controller is pressed, the display remains unlit and the unit does not start running.(Power indicator (()) is unlit and no lines appear on the remote controller.)

2. Cause

- 1) The power is not supplied to the indoor unit.
 - •The main power of the indoor unit is not on.
 - •The connector on the indoor unit board has come off.
 - •The fuse on the indoor unit board has melted.
 - •Transformer failure and disconnected wire of the indoor unit.
- 2) Incorrect wiring for the MA remote controller
 - *Disconnected wire for the MA remote controller or disconnected line to the terminal block.
 - Short-circuited MA remote controller wiring
 - •Incorrect wiring of the MA remote controller cables
 - •Incorrect connection of the MA remote wiring to the terminal block for transmission line (TB5) on the indoor unit
 - •Wiring mixup between the MA remote controller cable and 208-230 VAC power supply cable
 - *Reversed connection of the wire for the MA remote controller and the M-NET transmission line on the indoor unit
- The number of the MA remote controllers that are connected to an indoor unit exceeds the allowable range (2 units). Two PAR-31MAAU controllers are connected.
- 4) The length or the diameter of the wire for the MA remote controller are out of specification.
- 5) Short circuit of the wire for the remote display output of the outdoor unit or reversed polarity connection of the relay.
- 6) The indoor unit board failure
- 7) MA remote controller failure

- 1) Check the voltage at the MA remote controller terminals.
 - •If the voltage is between DC 9 and 12V, the remote controller is a failure.
 - •If no voltage is applied, check the causes 1) and 3) and if the cause is found, correct it. If no cause is found, refer to 2).
- Disconnect the remote controller cable from TB15 (MA remote controller terminal) on the indoor unit, and check the voltage across the terminals on TB15.
 - *If the voltage is between DC 9 and 12 V, check the causes 2) and 4) and if the cause is found, correct it.
 - •If no voltage is applied, check the cause 1) and if the cause is found, correct it.
 - If no cause is found, check the wire for the remote display output (relay polarity).
 - If no further cause is found, replace the indoor unit board.

8-1-2 The LCD Momentarily Lights Up and Then Goes Off.

1. Phenomena

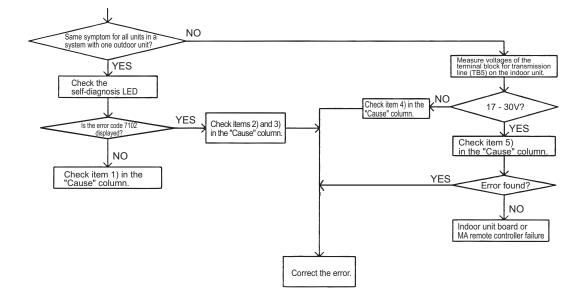
When the remote controller operation SW is turned on, the operation status briefly appears on the display, then it goes off, and the display lights out immediately, and the unit stops.

2. Cause

- The power for the M-NET transmission line is not supplied from the outdoor unit. For details, refer to the following page(s).
 [8-12-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 308)
 [8-13-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 310)
- 2) Short circuit of the transmission line.
- 3) Incorrect wiring of the M-NETtransmission line on the outdoorunit.
 - Disconnected wire for the MA remote controller or disconnected line to the terminal block.
 - •The indoor transmission line is connected incorrectly to the transmission terminal block for centralized controller (TB7).
 - •The male power supply connectors on the multiple outdoor units are connected to the female power supply switch connector (CN40).
 - In the system to which the power supply unit for transmission lines is connected, the male power supply connector is connected to the female power supply switch connector (CN40) on the outdoor unit.
- 4) Disconnected M-NET transmission line on the indoor unit side.
- 5) Disconnected wire between the terminal block for M-NET line (TB5) of the indoor unit and the indoor unit board (CN2M) or disconnected connector.

3. Check method and remedy

When 2) and 3) above apply, check code 7102 will be displayed on the self-diagnosis LED.



8-1-3 "HO" and "PLEASE WAIT" Do Not Go Off the Screen.

1. Phenomena

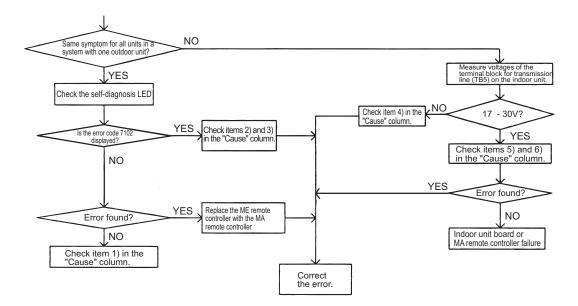
"HO" or "PLEASE WAIT" display on the remote controller does not disappear, and no operation is performed even if the button is pressed. ("HO" or "PLEASE WAIT" display will normally turn off 5 minutes later after the power on.)

2. Cause

- 1) The power for the M-NET transmission line is not supplied from the outdoor unit. For details, refer to the following page(s). [8-12-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 308)
 - [8-13-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 310)
- Short-circuited transmission line
- 3) Incorrect wiring of the M-NET transmission line on the outdoor unit.
 - •Disconnected wire for the MA remote controller or disconnected line to the terminal block.
 - •The indoor transmission line is connected incorrectly to the transmission terminal block for centralized controller (TB7).
 - •The male power supply connectors on the multiple outdoor units are connected to the female power supply switch connector (CN40).
 - In the system to which the power supply unit for transmission lines is connected, the male power supply connector is connected to the female power supply switch connector (CN40) on the outdoor unit
- 4) Disconnected M-NET transmission line on the indoor unit.
- 5) Disconnected wire between the terminal block for M-NET line (TB5) of the indoor unit and the indoor unit board (CN2M) or disconnected connector.
- 6) Incorrect wiring for the MA remote controller
 - *Short-circuited wire for the MA remote controller
 - *Disconnected wire for the MA remote controller (No.2) and disconnected line to the terminal block.
 - •Reversed daisy-chain connection between groups
 - •Incorrect wiring for the MA remote controller to the terminal block for transmission line connection (TB5) on the indoor unit
 - •The M-NET transmission line is connected incorrectly to the terminal block (TB15) for the MA remote controller.
- 7) The sub/main setting of the MA remote controller is set to sub. Two PAR-31MAAU controllers are connected.
- 8) 2 or more main MA remote controllers are connected.
- 9) Indoor unit board failure (MA remote controller communication circuit)
- 10) Remote controller failure
- 11) Outdoor failure (Refer to the following page(s). [8-18 Troubleshooting Problems Using the LED Status Indicators on the Outdoor Unit](page 322))

3. Check method and remedy

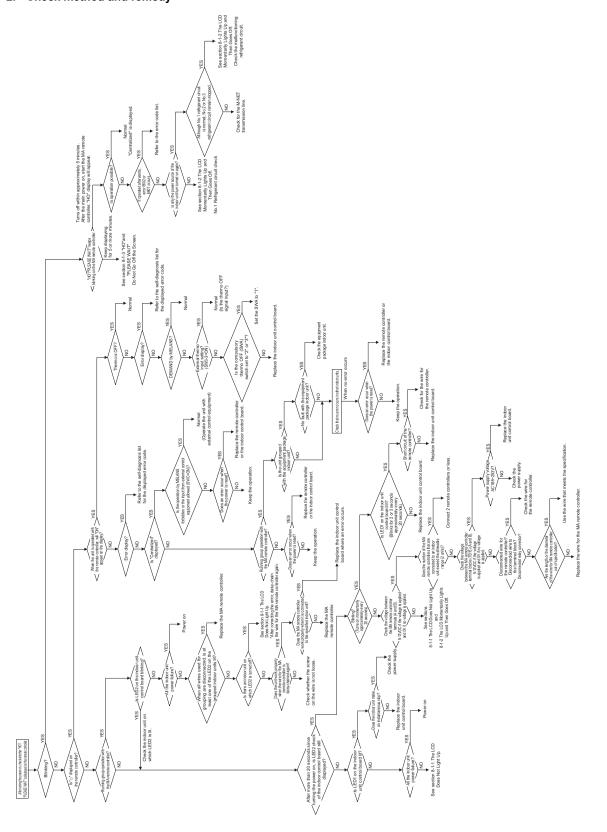
When 2) and 3) above apply, check code 7102 will be displayed on the self-diagnosis LED.



8-1-4 Air Conditioning Units Do Not Operate When the ON Button Is Pressed.

1. Phenomena

Even if the operation button on the remote controller is pressed, the indoor and the outdoor units do not start running.



8-2 ME remote Controller Problems

8-2-1 The LCD Does Not Light Up.

1. Phenomena

Even if the operation button on the remote controller is pressed, the display remains unlit and the unit does not start running. (Power indicator \odot does not appear on the screen.)

2. Cause

- 1) The power for the M-NET transmission line is not supplied from the outdoor unit.
- 2) Short circuit of the transmission line.
- 3) Incorrect wiring of the M-NET transmission line on the outdoor unit.
 - •Disconnected wire for the MA remote controller or disconnected line to the terminal block.
 - •The indoor transmission line is connected incorrectly to the transmission terminal block for centralized controller (TB7).
- 4) Disconnected transmission line on the remote controller.
- 5) Remote controller failure
- 6) Outdoor unit failure (For details, refer to the following page(s). [8-18 Troubleshooting Problems Using the LED Status Indicators on the Outdoor Unit](page 322))

- 1) Check voltage of the transmission terminal block for of the ME remote controller.
 - ◆If voltage between is 17V and 30V → ME remote controller failure
 - When voltage is 17V or less → For details, refer to the following page(s).
 - [8-12-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 308)
 - [8-13-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 310) When 2) and 3) above apply, check code 7102 will be displayed on the self-diagnosis LED.

8-2-2 The LCD Momentarily Lights Up and Then Goes Off.

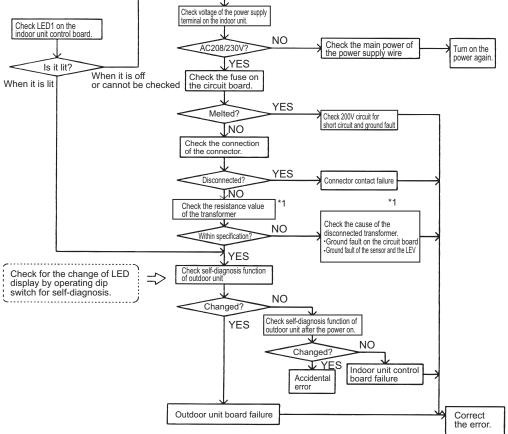
1. Phenomena

When the remote controller operation SW is turned on, a temporary operation display is indicated, and the display lights out immediately.

2. Cause

- 1) The power is not supplied to the indoor unit.
 - •The main power of the indoor unit (AC208/230V) is not on.
 - •The connector on the indoor unit board has come off.
 - •The fuse on the indoor unit board has melted.
 - Transformer failure and disconnected wire of the indoor unit
 - The indoor unit board failure
- 2) The outdoor control board failure

As the indoor unit does not interact with the outdoor unit, the outdoor unit model cannot be recognized.



*1. Refer to the parts catalog "transformer check".

8-2-3 "HO" Does Not Go Off the Screen.

1. Phenomena

"HO" display on the remote controller does not disappear, and no operation is performed even if the button is pressed.

2. Cause

Without using MELANS

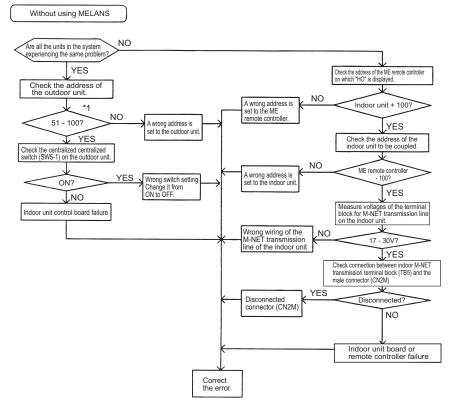
- 1) Outdoor unit address is set to "00"
- 2) A wrong address is set.
 - •The address of the indoor unit that is connected to the remote controller is incorrect. (It should equal the ME remote controller address plus 100.)
 - •A wrong address is set to the ME remote controller. (100 must be added to the address of the indoor unit.)
- 3) Faulty wiring of the terminal block for transmission line (TB5) of the indoor unit in the same group with the remote controller.
- 4) The centralized control switch (SW5-1) on the outdoor unit is set to ON.
- 5) Disconnection or faulty wiring of indoor unit transmission line.
- 6) Disconnection between the terminal block for M-NET line connection (TB5) of the indoor unit and the male connector (CN2M)
- 7) The male power supply connectors on 2 or more outdoor units are connected to the female power supply switch connector (CN40) for the transmission line for centralized control.
- 8) Outdoor unit control board failure
- 9) Indoor unit control board failure
- 10) Remote controller failure

Interlocking control with MELANS

- 1) No group registration is made using MELANS. (The indoor unit and the ME remote controller are not grouped.)
- 2) Disconnected transmission line for centralized control (TB7) of the outdoor unit
- 3) The male power supply connector is connected to CN40 on more than one outdoor unit, or the connector is connected to CN40 on the outdoor unit in the system to which a power supply unit for transmission line is connected.

Using MELANS

- When MELANS is used, "HO" display on the remote controller will disappear when the indoor unit and the local remote controller (ME remote controller) are grouped.
 - If "HO" does not disappear after the registration, check items 1) through 3) in the "Cause" column of the section on interlocked control with MELANS.



^{*1.} When the indoor unit address is set to 1 - 50, the address will be forcibly set to 100

8-2-4 "88" Appears on the LCD.

1. Phenomena

"88" appears on the remote controller when the address is registered or confirmed.

	Cause		Check method and remedy
An error occurs when the address is registered or confirmed. (common)			
1.	A wrong address is set to the unit to be coupled.	(1)	Confirm the address of unit to be coupled.
2.	The transmission line of the unit to be coupled is disconnected or is not connected.	(2)	Check the connection of transmission line.
3.	Circuit board failure of the unit to be coupled	(3)	Check voltage of the terminal block for transmission line of the unit to be coupled.
		1)	Normal if voltage is between DC17 and 30V.
4.	Improper transmission line work	2)	Check (5) in case other than 1).
Generates at interlocking registration between LOSS-NAY and the indoor unit			
5.	The power of LOSSNAY is OFF.	(4)	Check for the main power of LOSSNAY.
syste	erates at confirmation of controllers used in the em in which the indoor units connected to different por units are grouped		
6.	The power of the outdoor unit to be confirmed has been cut off.	(5)	Check the power supply of the outdoor unit which is coupled with the unit to be confirmed.
7.	Transmission line is disconnected from the terminal block for central control system connection (TB7) on the outdoor unit.	(6)	Check that the transmission line for centralized control (TB7) of the outdoor unit is not disconnected.
8.	When the indoor units connected to different outdoor units are grouped without MELANS, the male power supply connector is not connected to the female power supply switch connector (CN40) for the transmission line for centralized control.	(7)	Check voltage of the transmission line for centralized control.
9.	The male power supply connectors on 2 or more out- door units are connected to the female power supply switch connector (CN40) for the transmission line for centralized control.	1)	Normal when voltage is between 10V and 30V
10.	In the system to which MELANS is connected, the male power supply connector is connected to the female power supply switch connector (CN40) for the transmission line for centralized control.	2)	Check 8 - 11 described on the left in case other than 1).
11.	Short circuit of the transmission line for centralized control		

8-3 Refrigerant Control Problems

8-3-1 Units in the Cooling Mode Do Not Operate at Expected Capacity.

1. Phenomena

Although cooling operation starts with the normal remote controller display, the capacity is not enough

Cause	Check method and remedy
Compressor frequency does not rise sufficiently. Faulty detection of pressure sensor. Protection works and compressor frequency does not rise due to high discharge temperature Protection works and compressor frequency does not rise due to high pressure Pressure drops excessively.	(1) Check pressure difference between the detected pressure by the pressure sensor and the actual pressure with self-diagnosis LED. → If the accurate pressure is not detected, check the pressure sensor. Refer to the following page(s). [8-5-1 Comparing the High-Pressure Sensor Measurement and Gauge Pressure](page 267)
	Note: Lower inlet pressure by the low pressure sensor than the actual pressure causes insufficient capacity. SW4 setting (SW6-10: OFF)
	High pressure sensor SW4 ON 1 2 3 4 5 6 7 8 9 10 Low pressure sensor SW4 ON 1 2 3 4 5 6 7 8 9 10 ON 1 2 3 4 5 6 7 8 9 10
	•For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)
	(2) Check temperature difference between the evaporating temperature (Te) and the target evaporating temperature (Tem) with self-diagnosis LED.
	Note: Higher Te than Tem causes insufficient capacity. SW4 setting (SW6-10: OFF)
	Evaporating temperature Te SW4 ON 1 2 3 4 5 6 7 8 9 10 ON Target evaporating temperature Tem SW4 ON 1 2 3 4 5 6 7 8 9 10 ON 1 2 3 4 5 6 7 8 9 10 ON For how to read the SW settings, refer to the following page(s) IO 1 1 How to Pond the LED/(page 225)
	ing page(s). [9-1-1 How to Read the LED](page 325) Note: Protection works and compressor frequency does not rise even at higher Te than Tem due to high discharge temperature and high pressure. At high discharge temperature: Refer to the following page(s).[7-3-1 Error Code [1102]](page 180) At high pressure: Refer to the following page(s). [7-3-3 Error Code [1302] (during operation)](page 182)
2. Indoor unit LEV malfunction •Insufficient refrigerant flows due to LEV malfunction (not enough opening) or protection works and compressor frequency does not rise due to pressure drop. •Refrigerant leak from LEV on the stopping unit causes refrigerant shortage on the running unit.	Refer to the following page(s).[8-8 Troubleshooting LEV Problems](page 273)

	Cause	Check method and remedy
3.	RPM error of the outdoor unit FAN Motor failure or board failure, or airflow rate decrease due to clogging of the heat exchanger The fan is not properly controlled as the outdoor temperature cannot be precisely detected by the temperature sensor. The fan is not properly controlled as the pressure cannot be precisely detected by the pressure sensor.	Refer to the following page(s). [8-7 Troubleshooting Outdoor Unit Fan Problems](page 272) [7-7-2 Error Codes [5104, 5105, 5106, 5107, 5109, 5111]](page 211) [7-3-3 Error Code [1302] (during operation)](page 182)
4.	Long piping length The cooling capacity varies greatly depending on the pressure loss. (When the pressure loss is large, the cooling capacity drops.)	Check the piping length to determine if it is contributing to performance loss. Piping pressure loss can be estimated from the temperature difference between the indoor unit heat exchanger outlet temperature and the saturation
5.	Piping size is not proper (thin)	temperature (Te) of 63LS. →Correct the piping.
6.	Insufficient refrigerant amount Protection works and compressor frequency does not rise due to high discharge temperature.	Refer to item 1 (Compressor frequency does not rise sufficiently.) on the previous page. (page 259) Refer to the following page(s).[6-9 Evaluating and Adjusting Refrigerant Charge](page 161)
7.	Clogging by foreign object	Check the temperature difference between in front of and behind the place where the foreign object is clogging the pipe (upstream side and downstream side). When the temperature drops significantly, the foreign object may clog the pipe. → Remove the foreign object inside the pipe.
8.	The indoor unit inlet temperature is excessively. (Less than 15°C [59°F] WB)	Check the inlet air temperature and for short cycling. Change the environment where the indoor unit is used.
9.	Compressor failure The amount of circulating refrigerant decreases due to refrigerant leak in the compressor.	Check the discharge temperature to determine if the refrigerant leaks, as it rises if there is a leak.
10.	BC controller LEV 3 actuation failure Sufficient liquid refrigerant is not be supplied to the indoor unit as sufficient sub cool cannot be secured due to LEV3 malfunction.	Refer to the following page(s).[8-8 Troubleshooting LEV Problems](page 273) It most likely happens when there is little difference or no difference between TH12 and TH15.
11.	TH12, TH15 and 63HS1 sensor failure or faulty wiring LEV3 is not controlled normally.	Check the thermistor. Check wiring.

8-3-2 Units in the Heating Mode Do Not Operate at Expected Capacity.

1. Phenomena

Although heating operation starts with the normal remote controller display, the capacity is not enough.

Cause	Check method and remedy
Compressor frequency does not rise sufficiently. Faulty detection of pressure sensor. Protection works and compressor frequency does not rise due to high discharge temperature Protection works and compressor frequency does not rise due to high pressure.	(1) Check pressure difference between the detected pressure by the pressure sensor and the actual pressure with self-diagnosis LED. → If the accurate pressure is not detected, check the pressure sensor. Refer to the following page(s). [8-5-1 Comparing the High-Pressure Sensor Measurement and Gauge Pressure](page 267)
	Note: Higher inlet pressure by the high pressure sensor than the actual pressure causes insufficient capacity. SW4 setting (SW6-10: OFF)
	High pressure sensor SW4 ON Low pressure sensor SW4 ON 1 2 3 4 5 6 7 8 9 10 ON ON 1 2 3 4 5 6 7 8 9 10
	 For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)
	(2) Check the difference between the condensing temperature (Tc) and the target condensing temperature (Tcm) with self-diagnosis LED.
	Note: Higher Tc than Tcm causes insufficient capacity. SW4 setting (SW6-10: OFF)
	Condensing temperature Tc SW4 12 3 4 5 6 7 8 9 10 ON Target condensing temperature Tcm SW4 ON 12 3 4 5 6 7 8 9 10 ON For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)
	Note: Protection works and compressor frequency does not rise even at lower Tc than Tcm due to high discharge temperature and high pressure. At high discharge temperature: Refer to the following page(s).[7-3-1 Error Code [1102]](page 180) At high pressure: Refer to the following page(s).[7-3-3 Error Code [1302] (during operation)](page 182)

	Cause	Check method and remedy
2.	Indoor unit LEV malfunction Insufficient refrigerant flows due to LEV malfunction (not enough opening).	Refer to the following page(s).[8-8 Troubleshooting LEV Problems](page 273)
3.	Temperature reading error on the indoor unit piping temperature sensor If the temperature reading on the sensor is higher than the actual temperature, it makes the subcool seem smaller than it is, and the LEV opening decreases too much.	Check the thermistor.
4	RPM error of the outdoor unit FAN •Motor failure or board failure, or airflow rate decrease, pressure drop due to clogging of the heat exchanger leading to high discharge temperature •The fan is not properly controlled as the temperature cannot be precisely detected with the piping sensor.	Refer to the following page(s). [8-7 Troubleshooting Outdoor Unit Fan Problems](page 272)
5.	Insulation failure of the refrigerant piping	
6.	Long piping length Excessively long piping on the high pressure side causes pressure loss leading to increase in the high pressure.	Confirm that the characteristic of capacity drop due to piping length. → Change the pipe
7.	Piping size is not proper (thin)	
8.	Clogging by foreign object	Check the temperature difference between the upstream and the downstream of the pipe section that is blocked. Since blockage in the extended section is difficult to locate, operate the unit in the cooling cycle, and follow the same procedures that are used to locate the blockage of pipe during cooling operation. → Remove the blockage in the pipe.
9.	The indoor unit inlet temperature is excessively high.(exceeding 28°C [82°F])	Check the inlet air temperature and for short cycling. Change the environment where the indoor unit is used.
10.	Insufficient refrigerant amount Protection works and compressor frequency does not rise due to low discharge temperature Refrigerant recovery operation is likely to start.	Refer to item 1 (Compressor frequency does not rise sufficiently.) on the previous page. (page 261) Refer to the following page(s).[6-9 Evaluating and Adjusting Refrigerant Charge](page 161)
11.	Compressor failure (same as in case of cooling)	Check the discharge temperature.
12.	BC controller LEV 3 actuation failure A drop in the low pressure that is caused either by a blockage of liquid pipe or by a pressure loss and the resultant slowing of refrigerant flow causes a tenden- cy for the discharge temperature to rise.	Refer to the following page(s).[8-8 Troubleshooting LEV Problems](page 273)

8-3-3 Outdoor Units Stop at Irregular Times.

1. Phenomena

Outdoor unit stops at times during operation.

	Cause		Check method and remedy
	The first stop is not considered as an error, as the unit turns to anti-restart mode for 3 minutes as a preliminary error.	(1)	Check the mode operated in the past by displaying preliminary error history on LED display with SW4.
	Error mode	(2)	Reoperate the unit to find the mode that stops the
1)	Abnormal high pressure		unit by displaying preliminary error history on LED display with SW4.
2)	Abnormal discharge air temperature		Refer to the reference page for each error mode.
3)	Heatsink thermistor failure		*Display the indoor piping temperature table with SW4 to check whether the freeze proof operation runs properly, and check the temperature.
4)	Thermistor failure		Refer to the following page(s).9 LED Status Indica-
5)	Pressure sensor failure		tors on the Outdoor Unit Circuit Board(page 325)
6)	Over-current break		
7)	Refrigerant overcharge		
Note1:	Frost prevention tripping only under cooling mode may be considered in addition to the above. (Freeze protection is detected by one or all indoor units.)		
Note2:	Even the second stop is not considered as an error when some specified errors occur. (eg. The third stop is considered as an error when the thermistor error occurs.)		

8-4 Checking Transmission Waveform and for Electrical Noise Interference

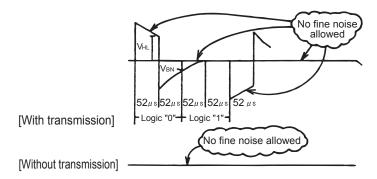
8-4-1 M-NET

Control is performed by exchanging signals between the outdoor unit and the indoor unit (ME remote controller) through M-NET transmission. Noise interference on the transmission line will interrupt the normal transmission, leading to erroneous operation.

(1) Symptoms caused by noise interference on the transmission line

Cause	ause Erroneous operation		Error code definition
	Signal is transformed and will be misjudged as the signal of another address.	6600	Address overlap
	Transmission wave pattern is transformed due to the noise creating a new signal	6602	Transmission processor hardware error
Noise interference on the transmission line	Transmission wave pattern is transformed due to the noise, and will not be received normally leading to no acknowledgement (ACK).	6607	No ACK error
	Transmission cannot be performed due to the fine noise.	6603	Transmission line bus busy error
	Transmission is successful; however, the acknowledgement (ACK) or the response cannot be received normally due to the noise.	6607 6608	No ACK error No response error

(2) Wave shape check



Wave shape check

Check the wave pattern of the transmission line with an oscilloscope. The following conditions must be met.

- Small wave pattern (noise) must not exist on the transmission signal. (Minute noise (approximately 1V) can be generated by DC-DC converter or the inverter operation; however, such noise is not a problem when the shield of the transmission line is grounded.)
- 2) The sectional voltage level of transmission signal should be as follows.

Logic Voltage level of the transmission line					
0	V _{HL} = 2.5V or higher				
1	V _{BN} = 1.3V or below				

(3) Check method and remedy

1) Measures against noise

Check the followings when noise exists on the wave or the errors described in (1) occur.

		Error code definition	Remedy
Check that the wiring work is performed according to wiring specifications.	1.	The transmission line and the power line are not wired too closely.	Isolate the transmission line from the power line (5cm [1-31/32"] or more). Do not insert them in the same conduit.
specifications.	2.	The transmission line is not bundled with that for another systems.	The transmission line must be isolated from another transmission line. When they are bundled, erroneous operation may be caused.
	3.	The specified wire is used for the transmission line.	Use the specified transmission line. Type: Shielded wire CVVS/CPEVS/MVVS (For ME remote controller) Diameter: 1.25mm ² [AWG16] or more (Remote controller wire: 0.3 - 1.25mm ² [AWG22-16])
	4.	When the transmission line is daisy-chained on the indoor unit terminals, are the shields daisy-chained on the terminals, too?	The transmission is two-wire daisy-chained. The shielded wire must be also daisy-chained. When the shielded cable is not daisy-chained, the noise cannot be reduced enough.
Check that the grounding work is performed according to grounding specifications.	5.	Is the shield of the indoor- outdoor transmission ca- ble grounded to the earth terminal on the outdoor unit?	Connect the shield of the indoor-outdoor transmission cable to the earth terminal (h) on the outdoor unit. If no grounding is provided, the noise on the transmission line cannot escape leading to change of the transmission signal.
	6.	Check the treatment method of the shield of the transmission line (for centralized control).	The transmission cable for centralized control is less subject to noise interference if it is grounded to the outdoor unit whose power jumper cable was moved from CN41 to CN40 or to the power supply unit. The environment against noise varies depending on the distance of the transmission lines, the number of the connected units, the type of the controllers to be connected, or the environment of the installation site. Therefore, the transmission line work for centralized control must be performed as follows.
			When no grounding is provided: Ground the shield of the transmission cable by connecting to the outdoor unit whose power jumper connector was moved from CN41 to CN40 or to the power supply unit.
			When an error occurs even though one point grounding is provided: Ground the shield on all outdoor units.

2) Check the followings when the error "6607" occurs, or "HO" appears on the display on the remote controller.

	Error code definition	Remedy
7.	The farthest distance of transmission line is 200m [656ft] or longer.	Check that the farthest distance from the outdoor unit to the indoor unit and to the remote controller is within 200m [656ft].
8.	The types of transmission lines are different.	Use the specified transmission line. Type: Shielded wire CVVS/CPEVS/MVVS (For ME remote controller) Diameter: 1.25mm² [AWG16] or more (Remote controller wire: 0.3-1.25mm² [AWG22-16])
9.	Outdoor unit circuit board failure	Replace the outdoor unit control board or the power supply board for the transmission line.
10.	Indoor unit circuit board failure or remote controller failure	Replace the indoor unit circuit board or the remote controller.
11.	The MA remote controller is connected to the M-NET transmission line.	Connect the MA remote controller to the terminal block for MA remote controller (TB15).

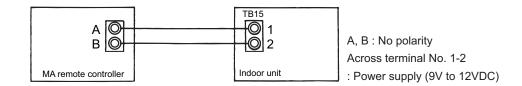
8-4-2 MA Remote Controller

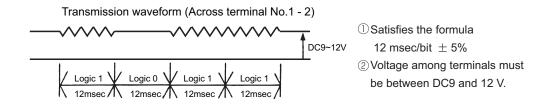
The communication between the MA remote controller and the indoor unit is performed with current tone burst.

(1) Symptoms caused by noise interference on the transmission line

If noise is generated on the transmission line, and the communication between the MA remote controller and the indoor unit is interrupted for 3 minutes in a row, MA transmission error (6831) will occur.

(2) Confirmation of transmission specifications and wave pattern

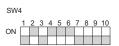




8-5 Pressure Sensor Circuit Configuration and Troubleshooting Pressure Sensor Problems

8-5-1 Comparing the High-Pressure Sensor Measurement and Gauge Pressure

By configuring the digital display setting switch (SW4 (when SW6-10 is set to OFF)) as shown in the figure below, the pressure as measured by the high-pressure sensor appears on the LED1 on the control board.



•For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)

- (1) While the sensor is stopped, compare the gauge pressure and the pressure displayed on self-diagnosis LED1.
- 1) When the gauge pressure is between 0 and 0.098MPa [14psi], internal pressure is caused due to gas leak.
- 2) When the pressure displayed on self-diagnosis LED1 is between 0 and 0.098MPa [14psi], the connector may be defective or be disconnected. Check the connector and go to (4).
- 3) When the pressure displayed on self-diagnosis LED1 exceeds 4.15MPa [601psi], go to (3).
- 4) If other than 1), 2) or 3), compare the pressures while the sensor is running. Go to (2).
- (2) Compare the gauge pressure and the pressure displayed on self-diagnosis LED1 while the sensor is running. (Compare them by MPa [psi] unit.)
- When the difference between both pressures is within 0.098MPa [14psi], both the high pressure sensor and the control board are normal.
- 2) When the difference between both pressures exceeds 0.098MPa [14psi], the high pressure sensor has a problem. (performance deterioration)
- 3) When the pressure displayed on self-diagnosis LED1 does not change, the high pressure sensor has a problem.
- (3) Remove the high pressure sensor from the control board to check the pressure on the self-diagnosis LED1.
- When the pressure displayed on self-diagnosis LED1 is between 0 and 0.098MPa [14psi], the high pressure sensor has a problem.
- 2) When the pressure displayed on self-diagnosis LED1 is approximately 4.15MPa [601psi], the control board has a problem.
- (4) Remove the high pressure sensor from the control board, and short-circuit between the No.2 and 3 connectors (63HS1) to check the pressure with self-diagnosis LED1.
- 1) When the pressure displayed on the self-diagnosis LED1 exceeds 4.15MPa [601psi], the high pressure sensor has a problem.
- 2) If other than 1), the control board has a problem.

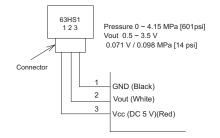
8-5-2 High-Pressure Sensor Configuration (63HS1,PS1,PS3)

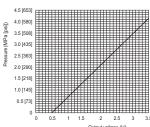
The high pressure sensor consists of the circuit shown in the figure below. If DC 5V is applied between the red and the black wires, voltage corresponding to the pressure between the white and the black wires will be output, and the value of this voltage will be converted by the microcomputer. The output voltage is 0.071V per 0.098MPa [14psi].

Note

The pressure sensor on the body side is designed to connect to the connector. The connector pin number on the body side is different from that on the control board side.

	Body side	Control board side
Vcc	Pin 1	Pin 3
Vout	Pin 2	Pin 2
GND	Pin 3	Pin 1





8-5-3 Comparing the Low-Pressure Sensor Measurement and Gauge Pressure

By configuring the digital display setting switch (SW4 (when SW6-10 is set to OFF)) as shown in the figure below, the pressure as measured by the low-pressure sensor appears on the LED1 on the control board.



•For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)

- (1) While the sensor is stopped, compare the gauge pressure and the pressure displayed on self-diagnosis LED1.
- 1) When the gauge pressure is between 0 and 0.098MPa [14psi], internal pressure is caused due to gas leak.
- 2) When the pressure displayed on self-diagnosis LED1 is between 0 and 0.098MPa [14psi], the connector may be defective or be disconnected. Check the connector and go to (4).
- 3) When the pressure displayed on self-diagnosis LED1 exceeds 1.7MPa [247psi], go to (3).
- 4) If other than 1), 2) or 3), compare the pressures while the sensor is running. Go to (2).
- (2) Compare the gauge pressure and the pressure displayed on self-diagnosis LED1 while the sensor is running.(Compare them by MPa [psi] unit.)
- 1) When the difference between both pressures is within 0.03MPa [4psi], both the low pressure sensor and the control board are normal.
- When the difference between both pressures exceeds 0.03MPa [4psi], the low pressure sensor has a problem. (performance deterioration)
- 3) When the pressure displayed on the self-diagnosis LED1 does not change, the low pressure sensor has a problem.
- (3) Remove the low pressure sensor from the control board to check the pressure with the self-diagnosis LED1 display.
- When the pressure displayed on the self-diagnosis LED1 is between 0 and 0.098MPa [14psi], the low pressure sensor has a problem.
- 2) When the pressure displayed on self-diagnosis LED1 is approximately 1.7MPa [247psi], the control board has a problem.
 - •When the outdoor temperature is 30°C [86°F] or less, the control board has a problem.
 - •When the outdoor temperature exceeds 30°C [86°F], go to (5).
- (4) Remove the low pressure sensor from the control board, and short-circuit between the No.2 and 3 connectors (63LS:CN202) to check the pressure with the self-diagnosis LED1.
- 1) When the pressure displayed on the self-diagnosis LED1 exceeds 1.7MPa [247psi], the low pressure sensor has a problem.
- 2) If other than 1), the control board has a problem.
- (5) Remove the high pressure sensor (63HS1) from the control board, and insert it into the connector for the low pressure sensor (63LS) to check the pressure with the self-diagnosis LED1.
- 1) When the pressure displayed on the self-diagnosis LED1 exceeds 1.7MPa [247psi], the control board has a problem.
- 2) If other than 1), the control board has a problem.

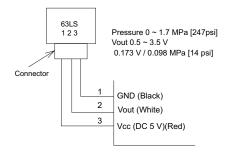
8-5-4 Low-Pressure Sensor Configuration (63LS)

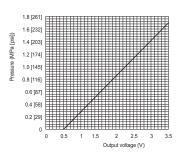
The low pressure sensor consists of the circuit shown in the figure below. If DC5V is applied between the red and the black wires, voltage corresponding to the pressure between the white and the black wires will be output, and the value of this voltage will be converted by the microcomputer. The output voltage is 0.173V per 0.098MPa [14psi].

Note

The pressure sensor on the body side is designed to connect to the connector. The connector pin number on the body side is different from that on the control board side.

	Body side	Control board side
Vcc	Pin 1	Pin 3
Vout	Pin 2	Pin 2
GND	Pin 3	Pin 1





Troubleshooting Solenoid Valve Problems 8-6

Check whether the output signal from the control board and the operation of the solenoid valve match.

Setting the self-diagnosis switch (SW4) as shown in the figure below causes the ON signal of each relay to be output to the LED's. Each LED shows whether the relays for the following parts are ON or OFF. LEDs light up when relays are on.

The circuits on some parts are closed when the relays are ON. Refer to the following instructions.

SW4 (SW6-10:OFF)		Display							
OW 1 (OW 0 10:01 1	OVV- (OVVO-10.011)		LD2	LD3	LD4	LD5	LD6	LD7	LD8
	Upper	21S4a	SV10			SV1a			SV11
SW4									
1 2 3 4 5 6 7 8 9 10 ON	Lower				SV5b				
	Upper	SV4a	SV4b				SV4d	SV9	
SW4									
ON 1 2 3 4 5 6 7 8 9 10	Lower								

- •For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)
- When a valve malfunctions, check if the wrong solenoid valve coil is not attached the lead wire of the coil is not disconnected, the connector on the board is not inserted wrongly, or the wire for the connector is not disconnected.

(1) In case of 21S4a (4-way switching valve)

About this 4-way valve

When not powered:

Conducts electricity between the oil separator outlet and heat exchanger AND the gas ball valve (BV1) and the accumulator to complete the circuit for the cooling cycle. When powered:

The electricity runs between the oil separator and the gas ball valve, and between the heat exchanger and the accumulator. This circulation is for heating.

Check the LED display and the intake and the discharge temperature for the 4-way valve to check whether the valve has no faults and the electricity runs between where and where Do not touch the pipe when checking the temperature, as the pipe on the oil separator side will be hot.

Note I

Do not give an impact from outside, as the outer hull will be deformed leading to the malfunction of the inner valve.

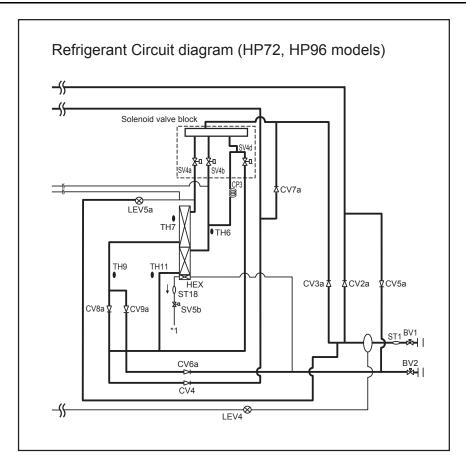
(2) In case of SV1a (Bypass valve)

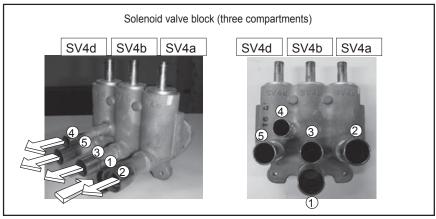
This solenoid valve opens when powered (Relay ON).

- 1) At compressor start-up, the SV1a turns on for 4 minutes, and the operation can be checked by the self-diagnosis LED display and the closing sound.
- 2) To check whether the valve is open or closed, check the change of the SV1a downstream piping temperature while the valve is being powered. Even when the valve is closed, high-temperature refrigerant flows inside the capillary next to the valve. (Therefore, temperature of the downstream piping will not be low with the valve closed.)

(3) SV4a, 4b, and 4d (HP72, HP96 models)(Controls heat exchanger capacity)

- 1) Depending on the conditions during Cooling-only operation, at least one of the solenoid valves among SV4a through 4d turns on. Check for proper operation on the LED and by listening for the operation sound of the solenoid valve.
- 2) During Heating-only operation, SV4a through 4d all turn on. Check for proper operation on the LED and by listening for the operation sound of the solenoid valves.
- 3) Depending on the conditions during Cooling-main or Heating-main operation, at least one of the solenoid valves among SV4a through 4d turns on. Check for proper operation on the LED and by listening for the operation sound of the solenoid valve.
- 4) The diagram on the next page shows the refrigerant flow. This diagram shows the flow of the high-temperature (high-pressure) gas refrigerant in the Cooling-only and Cooling-main modes and the flow of the low-temperature gas/liquid refrigerant in the Heating-only and Heating-main modes. Refer to the refrigerant circuit diagram. Solenoid valves turns on and off according to such factors as the capacity of the indoor units in operation and outside temperature. Check the LED. Remove the SV coil, open the lid, and check the plunger. The type of pin face wrench that is listed in the service parts list is required to perform this task.





(4) In the case of SV5b (Bypass valve)

This solenoid valve closes when energized (when the relay is on).

This valve turns off for three minutes after the completion of the defrost cycle, or when SV9 is on turned ON and the value of 63HS1 is greater than 3.5 MPa [507psi] during Heating-only or Heating-main operation at the minimum frequency. The valve position can be determined by measuring and monitoring the changes in the pipe temperature on the downstream of SV5b while the unit is de-energized. When the valve is open, high-temperature gas refrigerant passes through the pipe. Do not attempt to check the pipe temperature by touching the pipe.

(5) In the case of SV9 (Bypass valve)

This solenoid valve opens when energized (when the relay is on)

This valve turns on when the value of 63HS1 is greater than 3.5 MPa [507psi] during Heating-only or Heating-main operation at the minimum frequency. The valve position can be determined by measuring and monitoring the changes in the pipe temperature on the downstream of SV9 while the unit is energized. When the valve is open, high-temperature gas refrigerant passes through the pipe. Do not attempt to check the pipe temperature by touching the pipe.

(6) In the case of SV10

This solenoid valve opens when energized (when the relay is on)

The valve opens during the On-defrost cycle. The valve position can be determined by measuring and monitoring the changes in the pipe temperature on the downstream of SV10 while the unit is energized. When the valve is open, high-temperature gas refrigerant passes through the pipe. Do not attempt to check the pipe temperature by touching the pipe.

(7) In the case of SV11

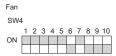
This solenoid valve opens when energized (when the relay is on)

The valve opens during the On-defrost cycle. The valve position can be determined by measuring and monitoring the changes in the pipe temperature on the downstream of SV11 while the unit is energized. When the valve is open, high-temperature gas refrigerant passes through the pipe. Do not attempt to check the pipe temperature by touching the pipe.

8-7 Troubleshooting Outdoor Unit Fan Problems

(1) Fan motor (common items)

- •To check the revolution of the fan, check the inverter output state on the self-diagnosis LED, as the inverter on the outdoor fan controls the revolutions of the fan. The revolution of the fan is approximately 680 rpm (HP72 model), 790 rpm (HP96 model) at full speed.
- •When starting the fan, the fan runs at full speed for 5 seconds.
- •When setting the DIP SW4 (when SW6-10 is set to OFF) as shown in the figure below, the inverter output [%] will appear. 100% indicates the full speed and 0% indicates the stopping.



•For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)

- •As the revolution of the fan changes under control, at the interphase or when the indoor unit operation capacity is low, the revolution of the fan may change.
- •If the fan does not move or it vibrates, Fan board problem or fan motor problem is suspected. When checking the fan motor for problems by shutting down the power, be sure to disconnect the motor wire from the fan board. If a short-circuited fan board malfunctions, it will keep the fan motor from rotating smoothly. For details, refer to the following page(s).

[8-10-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 291)

[8-10-7 Checking the Fan Board Error Detection Circuit at No Load](page 291)

[8-10-8 Checking the Fan Inverter for Damage at No Load](page 292)

[8-10-9 Checking the Fan Inverter for Damage with Load](page 293)

(YKMU)

[8-11-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems](page 301)

[8-11-7 Checking the Fan Board Error Detection Circuit at No Load](page 301)

[8-11-8 Checking the Fan Inverter for Damage at No Load](page 302)

[8-11-9 Checking the Fan Inverter for Damage with Load](page 303)

8-8 Troubleshooting LEV Problems

8-8-1 General Overview on LEV Operation

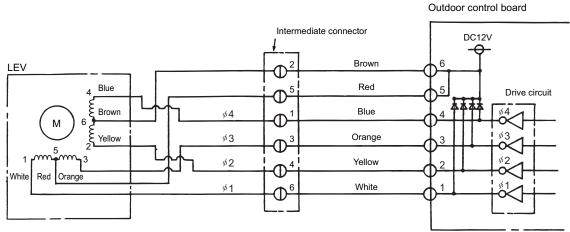
LEV operation

LEV are stepping-motor-driven valves that operate by receiving the pulse signals from the indoor and outdoor unit control boards.

(1) Outdoor LEV (LEV5a, LEV4), Indoor LEV and BC controller LEV

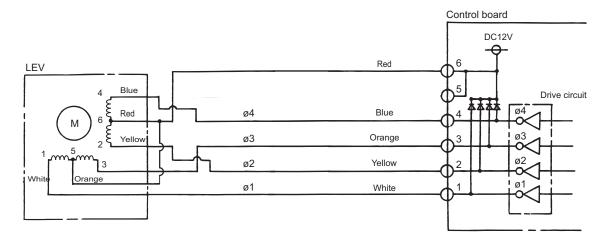
The valve opening changes according to the number of pulses.

1) Control boards and the LEV (Indoor unit LEV, and BC controller LEV1 (G type only) and LEV3)



Note. The connector numbers on the intermediate connector and the connector on the control board differ. Check the color of the lead wire to judge the number.

2) Control boards and the LEV (BC controller LEV1 (Applicable only to the GA and HA types.))



3) Pulse signal output and valve operation

Output (phase)	Output state						
number	1	2	3	4			
∮1	ON	OFF	OFF	ON			
φ 2	ON	ON	OFF	OFF			
φ 3	OFF	ON	ON	OFF			
φ 4	OFF	OFF	ON	ON			

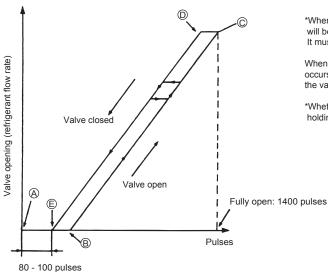
Output pulses change in the following orders when the

Valve is closed; $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 1$ Valve is open; $4 \rightarrow 3 \rightarrow 2 \rightarrow 1 \rightarrow 4$

- *1. When the LEV opening angle does not change,
- all the output phases will be off.

 *2. When the output is open phase or remains ON, the motor cannot run smoothly, and rattles and vibrates.

4) LEV valve closing and opening operation



*When the power is turned on, the valve closing signal of 2200 pulses will be output from the indoor board to LEV to fix the valve position. It must be fixed at point (A)

When the valve operates smoothly, no sound from LEV or no vibration occurs, however, when the pulses change from E to A in the chart or the valve is locked, a big sound occurs.

*Whether a sound is generated or not can be determined by holding a screwdriver against it, then placing your ear against the handle.

8-8-2 Possible Problems and Solutions

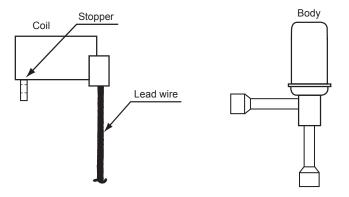
Malfunction mode	Judgment method	Remedy
Microcomputer driver circuit fail- ure	Disconnect the control board connector and connect the check LED as shown in the figure below.	When the drive circuit has a problem, replace the control board.
	resistance : 0.25W 1k Ω LED : DC15V 20mA or more When the main power is turned on, the indoor unit circuit board outputs pulse signals to the indoor unit LEV for 10 seconds. If any of the LED remains lit or unlit, the drive circuit is faulty.	
LEV mechanism is locked	If the LEV is locked, the drive motor runs idle, and makes a small clicking sound. When the valve makes a closing and opening sound, the valve has a problem.	Replace the LEV.
Disconnected or short-circuited LEV motor coil	If the resistance between the coils on indoor and BC controller LEVs (Indoor unit LEV: red-white, red-orange, brown-yellow, and brownblue; BC controller LEV: red-white, red-orange, red-yellow, and red-blue) as measured with a tester is in the range of 150 Ω ±10% (indoor unit LEV) or , 100 Ω ±10% (BC controller LEV), the LEVs are normal.	Replace the LEV coils.
	Measure resistance between the coils (red - white, red -orange, brown - yellow, brown - blue) using a tester. They are normal if resistance is $150\Omega\pm3\%$.	Replace the LEV coils.
Incomple sealing (leak from the valve)	When checking the refrigerant leak from the indoor LEV, run the target indoor unit in the fan mode, and the other indoor units in the cooling mode. Then, check the liquid temperature (TH22) with the self-diagnosis LED. When the unit is running in the fan mode, the LEV is fully closed, and the temperature detected by the thermistor is not low. If there is a leak, however, the temperature will be low. If the temperature is extremely low compared with the inlet temperature displayed on the remote controller, the LEV is not properly sealed, however, if there is a little leak, it is not necessary to replace the LEV when there are no effects to other parts.	If there is a large amount of leakage, replace the LEV.
	Thermistor (liquid piping temperature detection) Linear Expansion Valve	
Faulty wire con- nections in the connector or faulty contact	Check for loose pins on the connector and check the colors of the lead wires visually Disconnect the control board's connector and conduct a continuity check using a tester.	Check the continuity at the points where an error occurs.

8-8-3 Coil Removal Instructions

(1) Outdoor unit LEV (LEV5a, LEV4)

1) Components

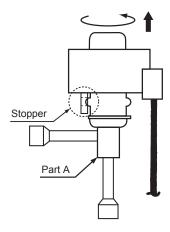
The outdoor unit LEV consists of a coil and a valve body that can be separated from each other.



2) Removing the coil

Securely hold the LEV at the bottom (as indicated by A in the figure), and turn the coil. After checking that the stopper is removed, pull up and out the coil.

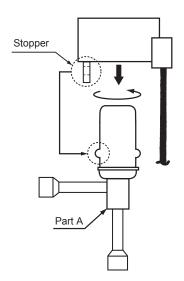
When removing the coil, hold the LEV body securely to prevent undue force from being placed on the pipe and bending the pipe.



3) Installing the coil

Securely hold the bottom of the LEV (section A in the figure), insert the coil from above, and turn the coil until the coil stopper is properly installed on the LEV body.

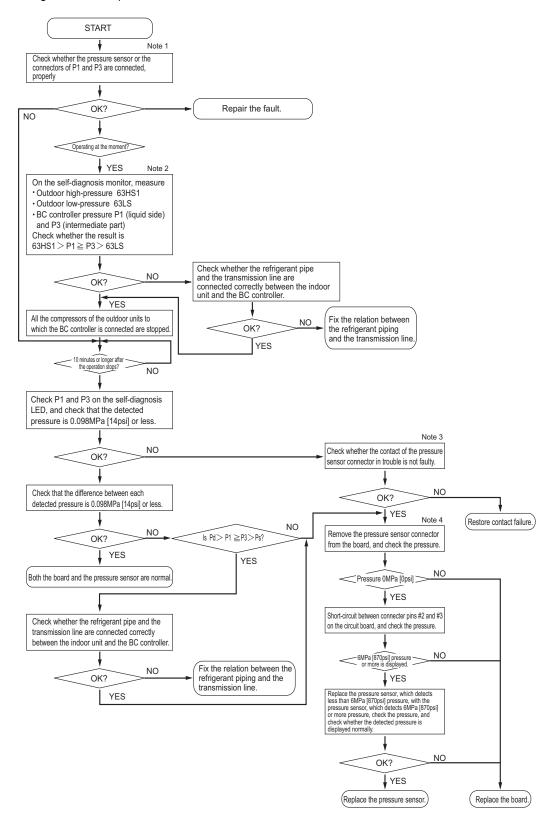
When removing the coil, hold the LEV body securely to prevent undue force from being placed on the pipe and bending the pipe.



8-9 Troubleshooting Problems with Major Components on BC Controller

8-9-1 Pressure Sensor

Troubleshooting flow chart for pressure sensor



Note

1) BC controller: Phenomena when the pressure sensor is connected wrongly (reverse connection of P1 and P3) to the board.

	Symptoms						
Cooling-only Cooling-main			Heating only		Heating main		
Normal	Non-cooling	SC16 small	Indoor heating SC small Heating indoor Thermo ON Especially noise is large.	00	Non-cooling Indoor heating SC small Heating indoor Thermo ON Especially noise is large.	SC11 large SC16 small △PHM large	

Note

2) Check the self-diagnosis switch (Outdoor control board SW4 (SW6-10:OFF)).

Measurement data	Symbol	SW4 setting value
Outdoor high pressure	63HS1	1 2 3 4 5 6 7 8 9 10 ON
Outdoor low pressure	63LS	1 2 3 4 5 6 7 8 9 10 ON
BC controller pressure (liquid side)	PS1	1 2 3 4 5 6 7 8 9 10 ON
BC controller pressure (intermediate part)	PS3	1 2 3 4 5 6 7 8 9 10 ON

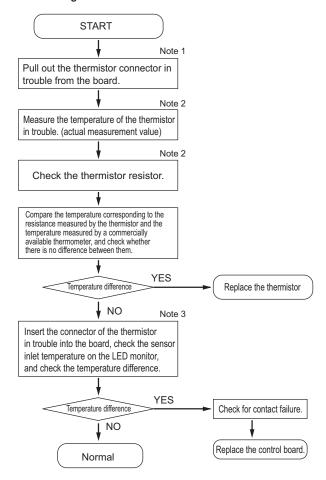
[•]For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)

Note

- 3) Check whether CNP1 (liquid side) connector on the BC controller control board and the connector CNP2 (intermediate part) are not disconnected or not loose.
- 4) Check the pressure value on the self-diagnosis switch (same as note 2) with the connector of the applied pressure sensor is disconnected from the board.

8-9-2 Temperature Sensor

Troubleshooting instructions for thermistor



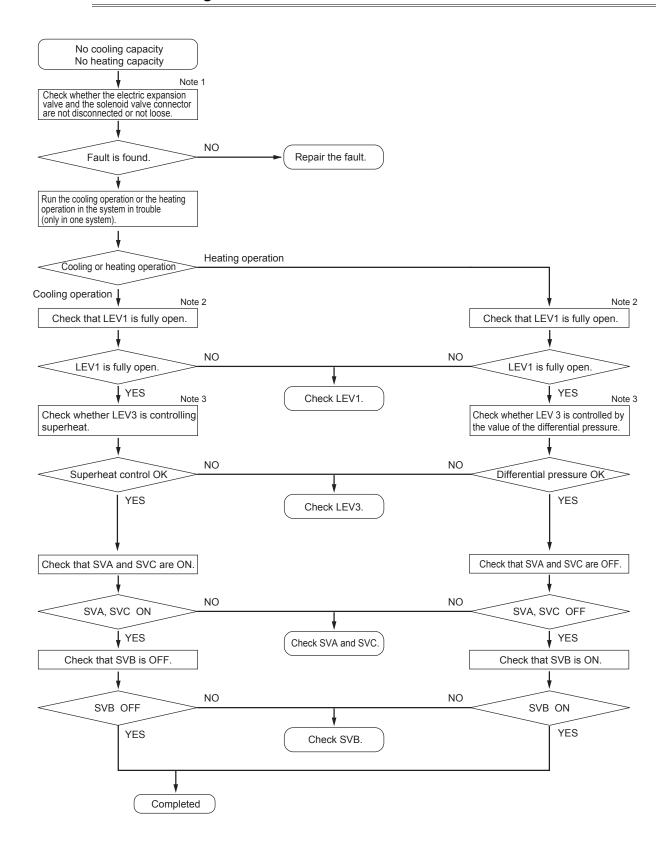
Note

- 1) For the connectors on the board, TH11 and TH12 are connected to CN10, and TH15 and TH16 are connected to CN11. Disconnect the connector in trouble, and check the sensor of each number.
- 2)
- •Pull out the sensor connector from the I/O board, Do not pull the sensor by holding the lead wire.
- •Measure the resistance with such as a tester.
- \bullet Compare the measured value with that of shown in the figure below. When the result is \pm 10%, it is normal.
- 3) Check the self-diagnosis switch (Outdoor control board SW1).

	Measurement data	Symbol	SW4 setting value
	Liquid inlet temperature	TH11	ON 1 2 3 4 5 6 7 8 9 10
G, GA, HA (Standard / main)	Bypass outlet temperature	TH12	ON 1 2 3 4 5 6 7 8 9 10
	Bypass inlet temperature	TH15	1 2 3 4 5 6 7 8 9 10 ON
	Bypass inlet temperature	TH16	1 2 3 4 5 6 7 8 9 10 ON
GB, HB	Bypass outlet temperature	TH12	1 2 3 4 5 6 7 8 9 10 ON
(Sub 1)	Bypass inlet temperature	TH15	1 2 3 4 5 6 7 8 9 10 ON
GB, HB	Bypass outlet temperature	TH12	1 2 3 4 5 6 7 8 9 10 ON
(Sub 2)	Bypass inlet temperature	TH15	1 2 3 4 5 6 7 8 9 10 ON

[•]For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)

8-9-3 Troubleshooting Flowchart for LEVs



Note

1) BC controller: Phenomena when LEV is connected wrongly (reverse connection of LEV1 and LEV3) to the board.

	Phenomena					
Cooling-only	Cooling-main	Heating only	Heating main			
Non-cooling SH12 small, SC11 small SC16 small, branch pipe SC small BC controller sound	Non-cooling and non-heating SH12 small, SC11 small SC16 large, but branch pipe SC small BC controller sound △PHM large	Indoor heating SC small △ PHM large	Non-cooling Indoor heating SC small △ PHM large			

- 2) Check method of fully open state or fully closed state of LEV
 - *Check LEV opening (pulse) on the self-diagnosis LED (Outdoor control board SW1). Full open: 2000 pulses

 - Fully closed: 110 pulses (In the case of heating-only mode, however, the pulse may become 110 or more.)

 •When LEV is fully open, measure the temperature at the upstream and downstream pipes of LEV, and make sure that there is no temperature difference.
 - •When LEV is fully closed, check that there is no refrigerant flowing sound.
- 3) Refer to the chart below to judge LEV opening controlled by the values of the differential pressure and of the superheat. (BC controller LEV basic operation characteristic)

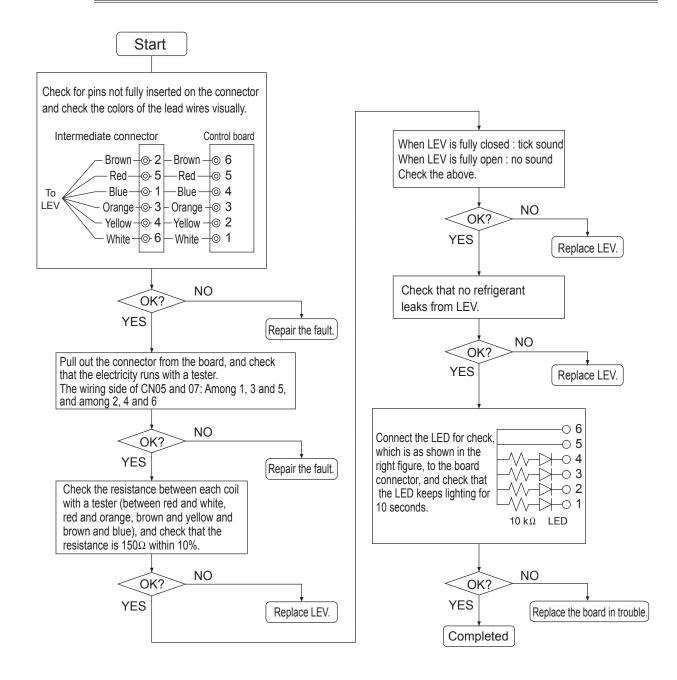
	Part	Malfunction mode	Operation mode	Content	Standards of judgment on unit stable operation
		Inclined to close	Heating only Heating-	Difference between high pressure (P1) and intermediate pressure (P3) is large.	0.3 to 0.4MPa
	LEV1	Inclined to open	main Cooling- main	Difference between high pressure (P1) and intermediate pressure (P3) is small.	[44 to 58psi]
G, GA, HA	LEV3	Inclined to	Cooling-only Cooling- main	SH12 is large.	SH12 < 20°C [36°F]
type		close	Heating only Heating- main	Difference between high pressure (P1) and intermediate pressure (P3) is small.	0.3 to 0.4MPa [44 to 58psi]
		Inclined to	Cooling-only Cooling- main	SC16 and SH12 are small.	SC16 > 3°C [5.4°F] SH12 > 3°C [5.4°F]
		open	Heating only Heating- main	Difference between high pressure (P1) and intermediate pressure (P3) is large.	0.3 to 0.4MPa [44 to 58psi]
GB, HB	close LEV3	Inclined to close	Cooling-only Cooling- main	SH22 is large.	SH22 < 20°C [36°F]
type)		Inclined to open	Cooling-only Cooling- main	SH22 is small.	SH22 > 3°C [5.4°F]

Self-diagnosis LED

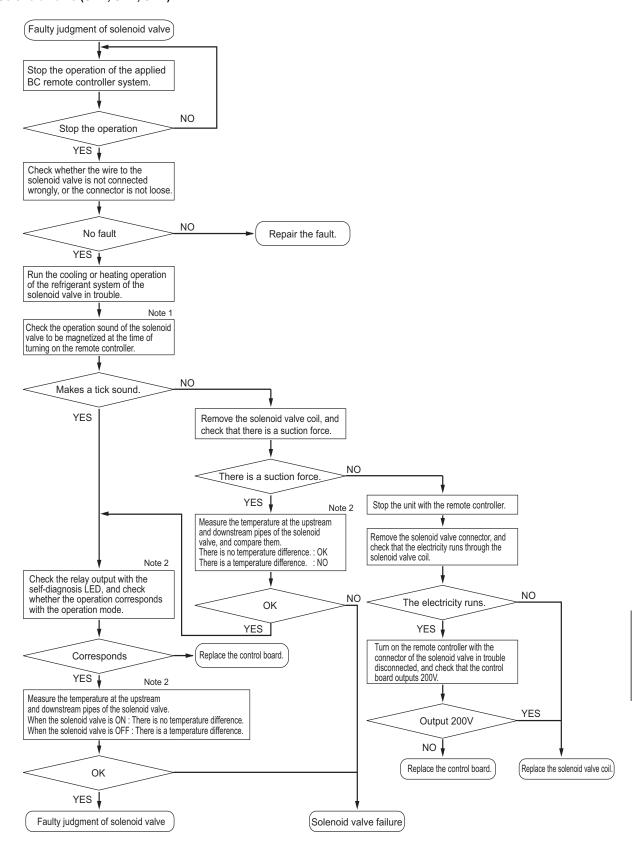
	Measurement data	Symbol	SW4 setting value
	LEV1 opening	_	ON 1 2 3 4 5 6 7 8 9 10
	LEV2 opening	_	ON 1 2 3 4 5 6 7 8 9 10
G, GA, HA (Standard / main)	LEV3 opening	_	1 2 3 4 5 6 7 8 9 10 ON
	BC controller bypass outlet superheat	SH12	ON 1 2 3 4 5 6 7 8 9 10
	BC controller intermediate part subcool	SC16	ON 1 2 3 4 5 6 7 8 9 10
	BC controller liquid-side subcool	SC11	ON 1 2 3 4 5 6 7 8 9 10
GB, HB (Sub 1)	LEV3 opening	_	ON 1 2 3 4 5 6 7 8 9 10
GB, HB (Sub 2)	LEV3 opening	_	1 2 3 4 5 6 7 8 9 10 ON

[•]For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)

8-9-4 Troubleshooting Flowchart for Solenoid Valves



(1) Solenoid valve (SVA, SVB, SVC)



Check whether the BC board output signal corresponds with the solenoid valve operation correspond.

Note

1) SVA, SVB, SVC

SVA, SVB, and SVC turn on or off according to the indoor unit operation mode.

				Mode		
		Cooling	Heating	Stopped	Defrost	Fan
	SVA	ON	OFF	OFF	OFF	OFF
Port	SVB	OFF	ON	OFF	OFF	OFF
	SVC	ON	OFF	OFF	OFF	ON

SVM1, SVM1b, SVM2, SVM2b

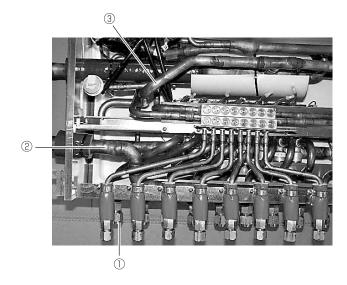
SVM1, SVM1b, SVM2, and SVM2b turn on or off according to the indoor unit operation mode.

Operation mode	Cooling only	Cooling main	Heating only	Heating main	Defrost	Stopped
SVM1,SVM1b	ON	Pressure dif- ferential con- trol OFF or ON	OFF	OFF	ON	OFF
SVM2, SVM2b	OFF	OFF	Pressure dif- ferential con- trol OFF or ON	Pressure dif- ferential con- trol OFF or ON	OFF	OFF

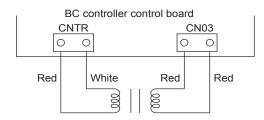
Note

2) SVA, SVB, SVC

Measure the temperature at the upstream and downstream pipes \odot and \circledcirc of SVA. Measure the temperature at the upstream and downstream \odot pipes and \circledcirc of SVB.



8-9-5 BC Controller Transformer



	Normal	Abnormal
CNTR(1)-(3)	about 58 Ω.	Open-phase or shorting
CN03(1)-(3)	about 1.6 Ω.	Open phase of shorting

^{*} Before measuring the resistance, pull out the connector.

8-10 Troubleshooting Inverter Problems (TKMU)

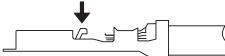
8-10-1 Inverter-Related Problems and Solutions

- •Replace only the compressor if only the compressor is found to be defective. (Overcurrent will flow through the inverter if the compressor is damaged, however, the power supply is automatically cut when overcurrent is detected, protecting the inverter from damage.)
- •Replace only the fan motor if only the fan motor is found to be defective. (Overcurrent will flow through the inverter if the fan motor is damaged, however, the power supply is automatically cut when overcurrent is detected, protecting the inverter from damage.)
- •Replace the defective components if the inverter is found to be defective.
- •If both the compressor and the inverter are found to be defective, replace the defective component(s) of both devices.

(1) Inverter-related problems: Troubleshooting and remedies

- 1) The INV board has a large-capacity electrolytic capacitor, in which residual voltage remains even after the main power is turned off, posing a risk of electric shock. Before inspecting the inverter-related items, turn off the main power, wait for 5 to 10 minutes, and confirm that the voltage at both ends of the electrolytic capacitor has dropped to a sufficiently low level.
- 2) Disconnect the outdoor unit fan board connector (CNINV) before performing maintenance work. (To plug or unplugconnectors, check that the outdoor unit fan is not rotating and that the voltage of capacitor in the main circuit is 20 VDC or below. The capacitor may collect a charge and cause an electric shock when the outdoor unit fan rotates in windy conditions. Refer to the wiring nameplate for details.)
- 3) To connect wiring to TB7, check that the voltage is 20 VDC or below.
- 4) Reconnect the connector (CNINV) to the fan board after completion of maintenance work.
- 5) The IPM on the inverter becomes damaged if there are loose screws are connectors. If a problem occurs after replacing some of the parts, mixed up wiring is often the cause of the problem. Check for proper connection of the wiring, screws, connectors, and Faston terminals.
- 6) To avoid damage to the circuit board, do not connect or disconnect the inverter-related connectors with the main power turned on.
- 7) Current sensors become damaged if electricity is passed through without them being connected to the circuit board. Connect the current sensor to the appropriate connectors on the circuit board before operating the inverter.
- 8) Faston terminals have a locking function. Make sure the terminals are securely locked in place after insertion.

Press the tab on the terminals to remove them.



- 9) When the IPM, diode stack, or IGBT is replaced, apply a thin layer of heat radiation grease that is supplied evenly to these parts. Wipe off any grease that may get on the wiring terminal to avoid terminal contact failure.
- 10) Faulty wiring to the compressor damages the compressor. Connect the wiring in the correct phase sequence.
- 11) When the power is turned on, the compressor is energized even while it is not operating. Before turning on the power, disconnect all power supply wires from the compressor terminal block, and measure the insulation resistance of the compressor. Check the compressor for a graound fault. If the insulation resistance is 1.0 MΩ or below, connect all power supply wires to the compressor and turn on the power to the outdoor unit. (The liquid refrigerant in the compressor will evaporate by energizing the compressor.)

	Error display/failure condition	Measure/inspection item
[1]	Inverter related errors 4250, 4255, 4220, 4225, 4230, 4240, 4260, 5301, 5305, 0403	Implement solutions that correspond to the error codes or preliminary error codes.[7-1 Error Code and Preliminary Error Code Lists](page 175)
[2]	Main power breaker trip	<1> Check the breaker capacity.
		<2> Check whether the electrical system is short-circuited or ground-faulted.
		<3> If <1> or <2> is not the cause of the problem, refer to the following page(s). [8-10-11 Solutions for the Main No-Fuse Breaker Trip](page 294)
[3]	Main power earth leakage breaker trip	<1> Check the earth leakage breaker capacity and the sensitivity current.
		<2> Meg failure for electrical system other than the inverter
		<3> If <1> or <2> is not the cause of the problem, refer to the following page(s). [8-10-11 Solutions for the Main No-Fuse Breaker Trip](page 294)
[4]	Only the compressor does not operate.	Check the inverter frequency on the LED monitor. If the frequency indicates that the units are in operation, refer to the following page(s). [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291)
[5]	The compressor vibrates violently at all times or makes an abnormal sound.	Refer to the following page(s). [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291)
[6]	Only the fan motor does not operate.	Check the inverter frequency on the LED monitor. If the frequency indicates that the units are in operation, refer to the following page(s). [8-10-7 Checking the Fan Board Error Detection Circuit at No Load](page 291) [8-10-8 Checking the Fan Inverter for Damage at No Load](page 292) [8-10-9 Checking the Fan Inverter for Damage with Load](page 293)
[7]	The fan motor shakes violently at all times or makes an abnormal sound.	Check the inverter frequency on the LED monitor. If the frequency indicates that the units are in operation, refer to the following page(s). [8-10-7 Checking the Fan Board Error Detection Circuit at No Load](page 291) [8-10-8 Checking the Fan Inverter for Damage at No Load](page 292) [8-10-9 Checking the Fan Inverter for Damage with Load](page 293)
[8]	Noise is picked up by the peripheral device	<1> Check that power supply wiring of the peripheral device does not run close to the power supply wiring of the outdoor unit.
		<2> Check that the inverter output wiring is not in close contact with the power supply wiring and the transmission lines.
		<3> Check that the shielded wire is used as the transmission line when it is required, and check that the grounding work is performed properly on the shielded wire.
		<4> Meg failure for electrical system other than the inverter
		<5> Attach a ferrite core to the inverter output wiring. (Contact the factory for details of the service part settings.)
		<6> Provide separate power supply to the air conditioner and other electric appliances.
		<7> If the problem suddenly appeared, inverter output may have had a ground fault. For details, refer to the following page(s). [8-10-5 Checking the Inverter for Damage during Compressor Operation](page 291)
		*Contact the factory for cases other than those listed above.
[9]	Sudden malfunction (as a result of external noise.)	<1> Check that the grounding work is performed properly.
		<2>Check that the shielded wire is used as the transmission line when it is required, and check that the grounding work is performed properly on the shielded wire.
		<3>Check that neither the transmission line nor the external connection wiring does not run close to another power supply system or does not run through the same conduit pipe.
		* Contact the factory for cases other than those listed above.

8-10-2 Checking the Inverter Board Error Detection Circuit

ı	Items to be checked		Phenomena	Remedy
(1)	Remove power supply.	Érro Deta	//overcurrent breaker trip or code: 4250 ail code: No. 101, 103, 104, 105, , and 107	Refer to the following page(s). [8-10-14 Troubleshooting Problems with Intelligent Power Module](page 296) Replace the IPM, and put the outdoor unit back into operation. If the problem persists, replace the INV board.
(2)	Disconnect the inverter output wire from the output terminals (U, V, W) of the IPM.	Erro	ic error or code: 4220 ail code: No. 111	Refer to the following page(s). [8-10-14 Troubleshooting Problems with Intelligent Power Module](page 296) Replace the IPM, and put the outdoor unit back into operation. If the problem persists, replace the INV board. Replace the INV board, and put the outdoor unit back into operation. If the problem persists, replace the DCCT.
(3)	Apply power supply.	Erro	CT sensor circuit failure or code: 5301 ail code: No.117	Replace the INV board.
(4)	Put the outdoor unit into operation.	Érro	CT sensor circuit failure or code: 5301 ail code: No.118	Replace the DCCT board. Replace the DCCT, and put the outdoor unit back into operation. If the problem persists, replace the INV board.
		Erro	l open or code: 5301 ail code: No.119	Normal

8-10-3 Checking the Compressor for Ground Fault and Coil Resistance Problems

Items to be checked		Phenomena	Remedy
Disconnect the compressor wiring, and check the compressor Meg, and coil resistance.	,	Compressor Meg failure Error if less than 1 Mohm. When no liquid refrigerant in the compressor	Replace the compressor Check that no liquid refrigerant in the compressor.
		Compressor coil resistance failure Coil resistance value of 0.092 Ω (20°C [68°F])	

8-10-4 Checking the Inverter for Damage at No-Load

	Items to be checked		Phenomena	Remedy	
(1)	(1) Remove power supply.		Inverter-related problems are detected.	Turn off SW1-1 and go to section 8-10-2.	
		2)	Inverter voltage is not output.	Check the connection between the IPM and the CNIPM on the INV board. Replace the IPM. If the problem persists, replace the INV board.	
(2)	Disconnect the inverter output wire from the output terminals (U, V, W) of the IPM.	3)	There is an voltage imbalance between the wires. Greater than 5% imbalance	Replace the IPM. If the problem persists, replace the INV board.	
(3)	Turn on SW1-1 on the INV board.		or 5V		
(4)	Apply power supply.	4)	There is no voltage imbal-	Normal	
(5)	Put the outdoor unit into operation.		ance between the wires.	*Turn off SW1-1	

8-10-5 Checking the Inverter for Damage during Compressor Operation

Items to be checked	Phenomena	Remedy
Put the outdoor unit into operation. Check the inverter output voltage after the inverter output frequency has stabilized.	1) Overcurrent-related prob- lems occur immediately af- ter compressor startup. (4250 Details: No.101, 102, 103, 106, 107)	 a. Check items 8-10-2 through 8-10-4 for problems. b. Check that high and low pressures are balanced. c. Check that no liquid refrigerant is present in the compressor. →Go to "d." when the problem persists after compressor startup was repeated several times. If normal operation is restored, check the belt heater for problems. d. Check that there is a pressure difference between high and low pressures after compressor startup. →Check the high pressure with LED monitor for changes. Replace the compressor if there is no pressure difference. (the compressor may be locked.)
	2) There is a voltage imbal- ance between the wires af- ter the inverter output voltage is stabilized. Greater than the larger of the following values: imbal- ance of 5% or 5V	If there is a voltage imbalance, replace the IPM. If the problem persists, replace the INV board. If the problem persists after replacing the above parts, go to section 8-10-3. Check the belt heater for problems if there is no voltage imbalance. —>When the error occurred, liquid refrigerant may have been present in the compressor.

8-10-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems

Items to be checked	Phenomena	Remedy
Remove fan motor winding. Check insulation resistance and coil resis-	1) Fan motor insulation failure. If < 1 M Ω , Defect.	Change fan motor.
tance.	Fan motor wire failure. Normal coil resistance is a few ohms. (Changes with temperature)	Change fan motor.

8-10-7 Checking the Fan Board Error Detection Circuit at No Load

	Items to be checked		Phenomena	Remedy
(1)	Turn off breaker. *Turn power off without fail.	1)	Electrical current over load error. Check code: 4255 Detail code: 101, 104	Change Fan board.
(2)	Remove Fan board CNINV and CNSNR connectors.	2)	Logic error Check code: 4255 Detail code:111	Change Fan board.
(3) (4)	Turn on breaker. Operate unit.	3)	Position error on start up Check code: 5305 Detail code: 132	Normal *After checking, return connector CNINV & CNSNR.

8-10-8 Checking the Fan Inverter for Damage at No Load

	Items to be checked		Phenomena	Remedy
(1)	Turn off breaker. *Turn power off without fail.	1)	Within 30 seconds from the start of operation, an error other than a position error (5305) (detail code 132) is detected.	Change Fan board.
(2)	Disconnect the connector CN-INV from the Fan board.	2)	Less than 5V unbalance in the wiring.	Change Fan board.
(3)	Set Fan board switch SW1-1 to ON.	3)	No unbalanced voltage in the wiring. After 30 second, detail code 132 is	Normal *After checking, return SW1&CN-
(4)	Turn on breaker.		produced and the system stops.	INV.
(5)	Operate unit. After about 30 seconds under no load with constant voltage output, the code below will be displayed indicating a position error (5305). Detail code: 132 Also, running with no load produces constant voltage of about 160V.			

8-10-9 Checking the Fan Inverter for Damage with Load

	Items to be checked	Phenomena	Remedy
(1)	Turn off breaker.	After operation, electrical overload er or position detection error and unit sto within 10 seconds. Check code: 4255, 5305 Detail code: 101, 132	
(2)	Turn on breaker.	2) RPM error before stat-up Check code: 5305 Detail code: 134	Change Fan board if the same error occurs after restart.
(3)	Operate unit.	Electrical current overload error durir operation Check code: 4255 Detail code: 101	a. Check for gusts or windy conditions. b. Go to 8-10-6 if not windy. c. After checking 8-10-6, and there is no problem, change Fan board. d. If replacing Fan board doesn't resolve issue, change fan motor.
		4) Sensor error during operation Check code: 5305 Detail code: 132, 133	a. Check for gusts or windy conditions. b. If no issues with wind, but the error is still present, change Fan board. c. Change fan motor if Fan board change doesn't resolve issue.
		5) Voltage overload error Check code: 4225 Detail code: 109	a. Check for gusts or windy conditions. b. Change Fan board if it is not windy.
		6) Load short circuit Check code: 4255 Detail code: 105	 a. Check 8-10-7 and 8-10-8. If no problem, then check wiring for short circuit. b. If there is no problem with item a. above, change fan motor. c. If same error after motor change, change Fan board.
		7) After RPM has stabilized, voltage unt ance of 5%, or 5V.	oal- a. If voltage is unbalanced, go to 8-10- 6. b. After checking 8-10-6, and there is no problem, change Fan board. c. If replacing Fan board doesn't resolve issue, change fan motor.

8-10-10 Checking the Installation Conditions

	Items to be checked	Phenomena	Remedy
(1)	Check refrigerant charge.	Overcharge of refrigerant	Return to correct refrigerant charge.
(2)	Check outdoor unit branch installation.	The branch approach <500 mm.	Make branch approach >500mm
	Stallation.	Is the branch angle < ±15° to horizontal?	Make branch angle < ±15°

8-10-11 Solutions for the Main No-Fuse Breaker Trip

	Items to be checked	Phenomena	Remedy
[1]	Perform Meg check between the terminals on the power terminal block TB1.	Zero to several ohm, or Meg failure	a. Check each part in the main inverter circuit. Refer to the following page(s). [8-10-13 Simple Check on Inverter
[2]	Turn on the power again and check again.	Main power breaker trip	Circuit Components](page 295)
	CHECK again.	2) No remote control display	Diode stack IPM Rush current protection resistor Electromagnetic relay DC reactor A compressor ground fault can be considered. Go to 8-10-3.
[3]	Turn on the outdoor unit and check that it operates normally.	Operates normally without tripping the main breaker.	a. The wiring may have been short-circuited. Search for the wire that short-circuited, and repair it. b. If item a) above is not the cause of the problem, the compressor may have a problem.
		2) Main power breaker trip	A compressor ground fault can be considered. Go to 8-10-3.

8-10-12 Solutions for the Main Earth Leakage Breaker Trip

	Items to be checked	Phenomena	Remedy
[1]	Check the earth leakage breaker capacity and the sensitivity current.	Use of a non-specified earth leakage breaker	Replace with a regulation earth leakage breaker.
[2]	Check the resistance at the power supply terminal block (TB1) with a megger.	Failure resistance value	Check each part and wiring. Refer to the following page(s). [8-10-13 Simple Check on Inverter Circuit Components](page 295) IPM Rush current protection resistor Electromagnetic relay DC reactor
[3]	Disconnect the compressor wirings and check the resistance of the compressor with a megger.	Failure compressor if the insulating resistance value is not in specified range. Failure when the insulating resistance value is 1 M Ω or less.	Check that there is no liquid refrigerant in the compressor. If there is none, replace the compressor.
[4]	Disconnect the fan motor wirings and check the resistance of the fan motor with a megger.	Failure fan motor if the insulating resistance value is not in specified range. Failure when the insulating resistance value is 1 $M\Omega$ or less.	Replace the fan motor.

Note

The insulation resistance could go down to close to $1M\Omega$ after installation or when the power is kept off for an extended period of time because of the accumulation of refrigerant in the compressor. If the earth leakage breaker is triggered, please use the following procedure to take care of this.

- •Disconnect the wires from the compressor's terminal block.
- •If the resistance is less than 1 M Ω , switch on the power for the outdoor unit with the wires still disconnected.
- *Leave the power on for at least 12 hours.
- •Check that the resistance has recovered to 1 $M\Omega$ or greater.

Earth leakage current measurement method

- •For easy on-site measurement of the earth leakage current, enable the filter with a measurement instrument that has filter functions as below, clamp all the power supply wires, and measure.
- Recommended measurement instrument: CLAMP ON LEAK HITESTER 3283 made by HIOKI E.E. CORPORATION
- •When measuring one device alone, measure near the device's power supply terminal block.

8-10-13 Simple Check on Inverter Circuit Components

Note

- •Turn off the power of the unit and leave it turned off for 10 minutes. Check that the voltage of the electrolytic capacitor (inverter main circuit) is 20 VDC or below. Then, remove the relevant parts from the control box.
- •Before checking, turn the power off and remove the parts to be checked from the control box.

Part name	Judgment method								
Diode stack	Refer to the following page(s). [8-10-15 Troubleshooting Problems with Diode Stack](page 297)								
IPM (Intelligent power module)	Refer to the following page(s). [8-10-14 Troubleshooting Problems with Intelligent Power Module](page 296)								
Rush current protection resis- tor R1(R2)	Measure the resistance between the + terminal on the diode stack and terminal TB31. (*Can be measured without the need to remove the noise filter board): $22~\Omega\pm10\%$								
Electromagnetic relay 72C	Note This electromagnetic relay is rated at 200VAC and is driven by a coil. The resistance between the coils in row A cannot be measured with a tester. Check only for shorting. Installation direction								
	Row Row Row Row A B C D E Check point Checking criteria								
	A2 44 34 24 14 Coil Between No. 1 pin and No. 3 pin of the CN03 on the noise filter board No. 1 pin and No. 1 pin and No. 1 pin and No. 3 pin of the CN03 on the noise filter board								
	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$								
	Test button								
DC reactor DCL	Measure the resistance between terminals: 1 Ω or lower (almost 0 Ω) Measure the resistance between terminals and the chassis: ∞								
Current sensor ACCT	Disconnect the CNCT2 connector and measure the resistance between terminals: 280 Ω± 30 Ω 1 - 2 PIN (U-phase),3 - 4 PIN (W-phase) IPM W V U ACCT-W ACCT-U ACCT-U								
	*Check the ACCT connection phase and the direction of the connection								

8-10-14 Troubleshooting Problems with Intelligent Power Module

Measure resistances between each pair of terminals on the IPM with a tester, and use the results for troubleshooting.

- 1) Notes on measurement
 - •Check the polarity before measuring. (On the tester, black normally indicates plus.)
 - •Check that the resistance is not open (∞ Ω) or not shorted (to 0 Ω).
 - •The values are for reference, and the margin of errors is allowed.
 - •The result that is more than double or half of the result that is measured at the same measurement point is not allowed.
- 2) Tester restriction
 - •Use the tester whose internal electrical power source is 1.5V or greater
 - •Use the dry-battery-powered tester.

Note

(The accurate diode-specific resistance cannot be measured with the button-battery-powered card tester, as the applied voltage is low.)

•Use a low-range tester if possible. A more accurate resistance can be measured.

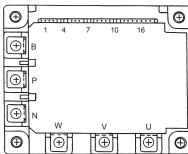
Judgment value (reference)

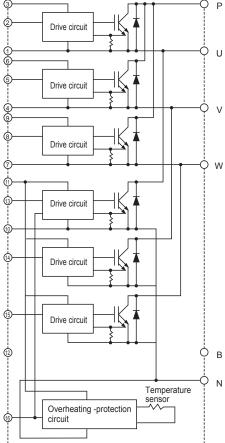
				Black (+)		
		Р	N	U	V	W
	Р	-	-	5 - 200 Ω	5 - 200 Ω	5 - 200 Ω
	N	-	-	∞	∞	∞
Red (-)	U	∞	5 - 200 Ω	-	-	-
	V	∞	5 - 200 Ω	-	-	-
	W	∞	5 - 200 Ω	-	-	-

Internal circuit diagram

External view







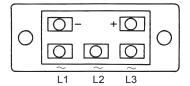
8-10-15 Troubleshooting Problems with Diode Stack

Measure resistances between each pair of terminals on the diode stack with a tester, and use the results for troubleshooting. For cautionary notes on measuring diode stack resistance and information on the types of testers to be used, refer to the following page(s). [8-10-14 Troubleshooting Problems with Intelligent Power Module](page 296)

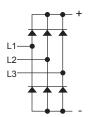
Judgment value (reference)

		Black (+)				
		+ (P)	- (N)	to (L1)	to (L2)	to (L3)
	+ (P)	-	-	5 - 200 Ω	5 - 200 Ω	5 - 200 Ω
	- (N)	-	-	8	8	∞
	to (L1)	8	5 - 200 Ω	-	-	-
Red (-)	to (L2)	8	5 - 200 Ω	-	-	-
	to (L3)	∞	5 - 200 Ω	-	-	-

External view



Internal circuit diagram



8-11 Troubleshooting Inverter Problems (YKMU)

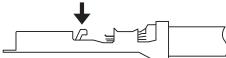
8-11-1 Inverter-Related Problems and Solutions

- •Replace only the compressor if only the compressor is found to be defective. (Overcurrent will flow through the inverter if the compressor is damaged, however, the power supply is automatically cut when overcurrent is detected, protecting the inverter from damage.)
- •Replace only the fan motor if only the fan motor is found to be defective. (Overcurrent will flow through the inverter if the fan motor is damaged, however, the power supply is automatically cut when overcurrent is detected, protecting the inverter from damage.)
- •Replace the defective components if the inverter is found to be defective.
- •If both the compressor and the inverter are found to be defective, replace the defective component(s) of both devices.

(1) Inverter-related problems: Troubleshooting and remedies

- 1) The INV board has a large-capacity electrolytic capacitor, in which residual voltage remains even after the main power is turned off, posing a risk of electric shock. Turn off the unit, leave it turned off for at least 10 minutes, and check that the voltage across FT-P and FT-N terminals on the INV board or the terminals at both ends of the electrolytic capacitor is 20V or below before checking inside the control box.
 - (It takes about 10 minutes to discharge electricity after the power supply is turn off.)
- 2) Disconnect the outdoor unit fan board connector (CNINV) before performing maintenance work. (To plug or unplugconnectors, check that the outdoor unit fan is not rotating and that the voltage of capacitor in the main circuit is 20 VDC or below. The capacitor may collect a charge and cause an electric shock when the outdoor unit fan rotates in windy conditions. Refer to the wiring nameplate for details.)
- 3) To connect wiring to TB7, check that the voltage is 20 VDC or below.
- 4) Reconnect the connector (CNINV) to the fan board after completion of maintenance work.
- 5) The IPM on the inverter becomes damaged if there are loose screws are connectors. If a problem occurs after replacing some of the parts, mixed up wiring is often the cause of the problem. Check for proper connection of the wiring, screws, connectors, and Faston terminals.
- 6) To avoid damage to the circuit board, do not connect or disconnect the inverter-related connectors with the main power turned on.
- 7) Faston terminals have a locking function. Make sure the terminals are securely locked in place after insertion.

Press the tab on the terminals to remove them.



- 8) When the IPM or IGBT is replaced, apply a thin layer of heat radiation grease that is supplied evenly to these parts. Wipe off any grease that may get on the wiring terminal to avoid terminal contact failure.
- 9) Faulty wiring to the compressor damages the compressor. Connect the wiring in the correct phase sequence.
- 10) When the power is turned on, the compressor is energized even while it is not operating. Before turning on the power, disconnect all power supply wires from the compressor terminal block, and measure the insulation resistance of the compressor. Check the compressor for a graound fault. If the insulation resistance is $1.0 \text{ M}\Omega$ or below, connect all power supply wires to the compressor and turn on the power to the outdoor unit. (The liquid refrigerant in the compressor will evaporate by energizing the compressor.)

	Error display/failure condition	Measure/inspection item
[1]	Inverter related errors 4250, 4255, 4220, 4225, 4230, 4240, 4260, 5301, 5305, 0403	Implement solutions that correspond to the error codes or preliminary error codes.[7-1 Error Code and Preliminary Error Code Lists](page 175)
[2]	Main power breaker trip	Refer to the following page(s). [8-11-11 Solutions for the Main No-Fuse Breaker Trip](page 304)
[3]	Main power earth leakage breaker trip	Refer to the following page(s). [8-11-12 Solutions for the Main Earth Leakage Breaker Trip](page 304)
[4]	Only the compressor does not operate.	Check the inverter frequency on the LED monitor. If the frequency indicates that the units are in operation, refer to the following page(s). [8-11-5 Checking the Inverter for Damage during Compressor Operation](page 301)
[5]	The compressor vibrates violently at all times or makes an abnormal sound.	Refer to the following page(s). [8-11-5 Checking the Inverter for Damage during Compressor Operation](page 301)
[6]	Only the fan motor does not operate.	Check the inverter frequency on the LED monitor. If the frequency indicates that the units are in operation, refer to the following page(s). [8-11-7 Checking the Fan Board Error Detection Circuit at No Load](page 301) [8-11-8 Checking the Fan Inverter for Damage at No Load](page 302) [8-11-9 Checking the Fan Inverter for Damage with Load](page 303)
[7]	The fan motor shakes violently at all times or makes an abnormal sound.	Check the inverter frequency on the LED monitor. If the frequency indicates that the units are in operation, refer to the following page(s). [8-11-7 Checking the Fan Board Error Detection Circuit at No Load](page 301) [8-11-8 Checking the Fan Inverter for Damage at No Load](page 302) [8-11-9 Checking the Fan Inverter for Damage with Load](page 303)
[8]	Noise is picked up by the peripheral device	<1> Check that power supply wiring of the peripheral device does not run close to the power supply wiring of the outdoor unit.
		<2> Check if the inverter output wiring is not running parallel to the power supply wiring and the transmission lines.
		<3> Check that the shielded wire is used as the transmission line when it is required, and check that the grounding work is performed properly on the shielded wire.
		<4> Meg failure for electrical system other than the inverter
		<5> Attach a ferrite core to the inverter output wiring. (Contact the factory for details of the service part settings.)
		<6> Provide separate power supply to the air conditioner and other electric appliances.
		<7> If the problem suddenly appeared, inverter output may have had a ground fault. For details, refer to the following page(s). [8-11-5 Checking the Inverter for Damage during Compressor Operation](page 301)
		*Contact the factory for cases other than those listed above.
[9]	Sudden malfunction (as a result of external noise.)	<1> Check that the grounding work is performed properly.
		<2>Check that the shielded wire is used as the transmission line when it is required, and check that the grounding work is performed properly on the shielded wire.
		<3>Check that neither the transmission line nor the external connection wiring does not run close to another power supply system or does not run through the same conduit pipe.
		* Contact the factory for cases other than those listed above.

8-11-2 Checking the Inverter Board Error Detection Circuit

	Items to be checked		Phenomena	Remedy
(1)	Remove power supply.	1)	Overcurrent error Error code: 4250 Detail code: No. 101, 104, 105, 106, and 107	Replace the INV board.
(2)	Disconnect the inverter output wire from the terminals of the INV board (SC-U, SC-V, SC-W).	2)	Logic error Error code: 4220 Detail code: No. 111	Replace the INV board.
(3)	Apply power supply.	3)	ACCT sensor circuit failure Error code: 5301 Detail code: No.117	Replace the INV board.
(4)	Put the outdoor unit into operation.	4)	IPM open Error code: 5301 Detail code: No.119	Normal

8-11-3 Checking the Compressor for Ground Fault and Coil Resistance Problems

Items to be checked	Phenomena	Remedy
Disconnect the compressor wiring, and check the compressor Meg, and coil resistance.	Compressor Meg failure Error if less than 1 Mohm.	Check that there is no liquid refrigerant in the compressor. If there is none, replace the compressor.
	2) Compressor coil resistance failure Coil resistance value of 0.32 Ω (20°C [68°F])	Replace the compressor.

8-11-4 Checking the Inverter for Damage at No-Load

	Items to be checked		Phenomena	Remedy
(1)	Remove power supply.	1)	Inverter-related problems are detected.	Connect the short-circuit connector to CN6, and go to section 8-11-2.
(2)	Disconnect the inverter output wire from the terminals of the INV board (SC-U, SC-V, SC-W).	2)	Inverter voltage is not output at the terminals (SC-U, SC-V, and SC-W)	Replace the INV board.
(3)	Disconnect the short-circuit connector from CN6 on the INV board.	3)	There is an voltage imbalance between the wires. Greater than 5% imbalance or 5V	Replace the INV board.
(4)	Apply power supply.			
(5)	Put the outdoor unit into operation. Check the inverter output voltage after the inverter output frequency has stabilized.	4)	There is no voltage imbalance between the wires.	Normal *Reconnect the short-circuit connector to CN6 after checking the voltage.

8-11-5 Checking the Inverter for Damage during Compressor Operation

Items to be checked		Phenomena		Remedy
Put the outdoor unit into operation. Check the inverter output voltage af-	1)	Overcurrent-related problems occur immediately after compressor startup. Error code: 4250	a.	Check items 8-11-2 through 8-11-4 for problems.
ter the inverter output frequency has stabilized.		Detail code : 4250 Detail code : 101, 102, 106, 107	b.	Check that high and low pressures are balanced.
			C.	Check that no liquid refrigerant is present in the compressor. →Go to "d." when the problem persists after compressor start-up was repeated several times. If normal operation is restored, check the belt heater for problems.
			d.	Check that there is a pressure difference between high and low pressures after compressor startup. → Check the high pressure with LED monitor for changes. Replace the compressor if there is no pressure difference. (the compressor may be locked.)
	2)	There is a voltage imbalance between the wires after the inverter output voltage is stabilized. Greater than the larger of the following values: imbalance of 5% or 5V	vol Ch the →\ refi	place the INV board if there is a tage imbalance. eck the belt heater for problems if are is no voltage imbalance. When the error occurred, liquid rigerant may have been present he compressor.

8-11-6 Checking the Fan Motor for Ground Fault and Coil Resistance Problems

Items to be checked	Phenomena	Remedy
Remove fan motor winding. Check insulation resistance and coil resistance	1) Fan motor insulation failure. If < 1 MΩ, Defect.	Change fan motor.
tance.	Fan motor wire failure. Normal coil resistance is a few ohms. (Changes with temperature)	Change fan motor.

8-11-7 Checking the Fan Board Error Detection Circuit at No Load

	Items to be checked		Phenomena	Remedy
(1)	Turn off breaker. *Turn power off without fail.	1)	Electrical current over load error. Check code: 4255 Detail code: 101, 104	Change fan board.
(2)	Remove fan board CNINV and CNSNR connectors.	2)	Logic error Check code: 4225 Detail code:111	Change fan board.
(3) (4)	Turn on breaker. Operate unit.	3)	Position error on start up Check code: 5305 Detail code: 132	Normal *After checking, return connector CNINV & CNSNR.

8-11-8 Checking the Fan Inverter for Damage at No Load

	Items to be checked		Phenomena	Remedy
(1)	Turn off breaker. *Turn power off without fail.	1)	Within 30 seconds from the start of operation, an error other than a position error (5305) (detail code 132) is detected.	Change fan board.
(2)	Disconnect the connector CN-INV from the fan board.	2)	Less than 5V unbalance in the wiring.	Change fan board.
(3)	Set fan board switch SW1-1 to ON.	3)	No unbalanced voltage in the wiring. After 30 second, detail code 132 is	Normal *After checking, return SW1&CN-
(4)	Turn on breaker.		produced and the system stops.	INV.
(5)	Operate unit. After about 30 seconds under no load with constant voltage output, the code below will be displayed indicating a position error (5305). Detail code: 132 Also, running with no load produces constant voltage of about 160V.			

8-11-9 Checking the Fan Inverter for Damage with Load

	Items to be checked	Phenomena	Remedy
(1)	Turn off breaker.	After operation, electrical overload error or position detection error and unit stops within 10 seconds. Check code: 4255, 5305 Detail code: 101, 132	Check for fan motor lock. →If locked, change for fan motor. If the same error is still present after changing fan motor, change INV board. →If not locked, refer to 3) & 4).
(2)	Turn on breaker.	RPM error before stat-up Check code: 5305 Detail code: 134	Change Fan board if the same error occurs after restart.
(3)	Operate unit.	Electrical current overload error during operation Check code: 4255 Detail code: 101	a. Check for gusts or windy conditions. b. Go to 8-11-6 if not windy. c. After checking 8-11-6, and there is no problem, change Fan board. d. If replacing Fan board doesn't resolve issue, change fan motor.
		4) Sensor error during operation Check code: 5305 Detail code: 132, 133	a. Check for gusts or windy conditions. b. If no issues with wind, but the error is still present, change Fan board. c. Change fan motor if Fan board change doesn't resolve issue.
		5) Voltage overload error Check code: 4225 Detail code: 109	a. Check for gusts or windy conditions. b. Change Fan board if it is not windy.
		6) Load short circuit Check code: 4255 Detail code: 105	a. Check 8-11-7 and 8-11-8. If no problem, then check wiring for short circuit. b. If there is no problem with item a. above, change fan motor. c. If same error after motor change, change Fan board.
		7) After RPM has stabilized, voltage unbalance of 5%, or 5V.	a. If voltage is unbalanced, go to 8-11-6. b. After checking 8-11-6, and there is no problem, change Fan board. c. If replacing Fan board doesn't resolve issue, change fan motor.

8-11-10 Checking the Installation Conditions

	Items to be checked	Phenomena	Remedy
(1)	Check refrigerant charge.	Overcharge of refrigerant	Return to correct refrigerant charge.
(2)	Check outdoor unit branch installation.	The branch approach <500 mm.	Make branch approach >500mm
	Stallation.	Is the branch angle < ±15° to horizontal?	Make branch angle < ±15°

8-11-11 Solutions for the Main No-Fuse Breaker Trip

	Items to be checked		Phenomena	Remedy	
[1]	Check the breaker capacity.	Us er	se of a non-specified break-	Replace it with a specified breaker.	
[2]	Perform Meg check between the terminals on the power terminal block TB1.		ero to several ohm, or Meg illure	Check each part and wiring. Refer to the following page(s).[8-11-13 Simple Check on Inverter Circuit Components/(page 305)	
[3]	Turn on the power again and	1) Ma	lain power breaker trip	nents](page 305) •IGBT module	
	check again.	2) No	o remote control display	Rush current protection resistor Electromagnetic relay DC reactor	
[4]	Turn on the outdoor unit and check that it operates normally.	, ,	perates normally without ipping the main breaker.	a) The wiring may have been short-circui ed. Search for the wire that short-circui	
		2) Ma	ain power breaker trip	ed, and repair it. b) If item a) above is not the cause of the problem, refer to 8-11-2 - 8-11-10	

8-11-12 Solutions for the Main Earth Leakage Breaker Trip

	Items to be checked	Phenomena	Remedy
[1]	Check the earth leakage breaker capacity and the sensitivity current.	Use of a non-specified earth leakage breaker	Replace with a regulation earth leakage breaker.
[2]	Check the resistance at the power supply terminal block with a megger.	Failure resistance value	Check each part and wiring. Refer to the following page(s).[8-11-13 Simple Check on Inverter Circuit Components](page 305) •IGBT module •Rush current protection resistor •Electromagnetic relay •DC reactor
[3]	Disconnect the compressor wirings and check the resistance of the compressor with a megger.	Failure compressor if the insulating resistance value is not in specified range. Failure when the insulating resistance value is 1 M Ω or less.	Check that there is no liquid refrigerant in the compressor. If there is none, replace the compressor.
[4]	Disconnect the fan motor wirings and check the resistance of the fan motor with a megger.	Failure fan motor if the insulating resistance value is not in specified range. Failure when the insulating resistance value is 1 $M\Omega$ or less.	Replace the fan motor.

Note

The insulation resistance could go down to close to 1 $M\Omega$ after installation or when the power is kept off for an extended period of time because of the accumulation of refrigerant in the compressor. If the earth leakage breaker is triggered, please use the following procedure to take care of this.

- •Disconnect the wires from the compressor's terminal block.
- \bullet If the resistance is less than 1 M Ω , switch on the power for the outdoor unit with the wires still disconnected.
- •Leave the power on for at least 12 hours.
- •Check that the resistance has recovered to 1 $M\Omega$ or greater.

Earth leakage current measurement method

- •For easy on-site measurement of the earth leakage current, enable the filter with a measurement instrument that has filter functions as below, clamp all the power supply wires, and measure.
- Recommended measurement instrument: CLAMP ON LEAK HITESTER 3283 made by HIOKI E.E. CORPORATION
- •When measuring one device alone, measure near the device's power supply terminal block.

8-11-13 Simple Check on Inverter Circuit Components

Note

Before inspecting the inside of the control box, turn off the power, keep the unit off for at least 10 minutes, and confirm that the voltage between FT-P and FT-N on INV Board has dropped to DC20V or less.

Part name	Judgment method							
IGBT module	Refer to the following page(s). [8-11-14 Troubleshooting Problems with IGBT Module](page 305)							
Rush current protection resistor R1, R5	Measure the resistance between terminals R1 and R5: 22 Ω±10%							
Electromagnetic relay 72C	This electromagnetic relay is rated at DC12V and is driven by a coil. Check the resistance between terminals Upper 1 2 3 4 Check point Checking criteria(W) Installation direction Coil Between Terminals 5 and 6 Not to be short-circuited (Center value 75 ohm) Contact Between Terminals 3 and 4 ∞							
DC reactor DCL	Measure the resistance between terminals: 1Ω or lower (almost 0 Ω) Measure the resistance between terminals and the chassis: ∞							

8-11-14 Troubleshooting Problems with IGBT Module

Measure the resistances between each pair of terminals on the IGBT with a tester, and use the results for troubleshooting. The terminals on the INV board are used for the measurement.

- 1) Notes on measurement
 - •Check the polarity before measuring. (On the tester, black normally indicates plus.)
 - •Check that the resistance is not open (∞ Ω) or not shorted (to 0 Ω).
 - •The values are for reference, and the margin of errors is allowed.
 - •The result that is more than double or half of the result that is measured at the same measurement point is not allowed.
 - •Disconnect all the wiring connected the INV board, and make the measurement.
- 2) Tester restriction
 - •Use the tester whose internal electrical power source is 1.5V or greater
 - •Use the dry-battery-powered tester.

Note

(The accurate diode-specific resistance cannot be measured with the button-battery-powered card tester, as the applied voltage is low.)

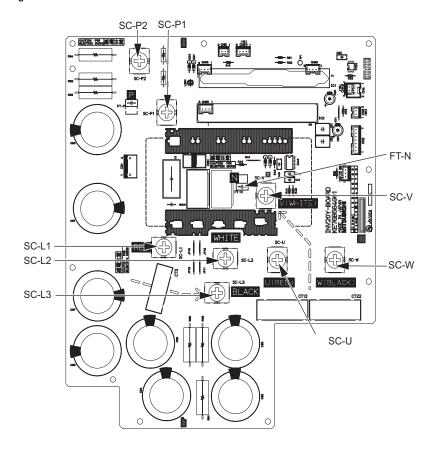
•Use a low-range tester if possible. A more accurate resistance can be measured.

Judgment value (reference)

		Black (+)					
		SC-P1	FT-N	SC-L1	SC-L2	SC-L3	
Red (-)	SC-P1	-	-	5 - 200 Ω	5 - 200 Ω	5 - 200 Ω	
	FT-N	-	-	∞	∞	∞	
	SC-L1	8	5 - 200 Ω	-	-	-	
	SC-L2	8	5 - 200 Ω	-	-	-	
	SC-L3	8	5 - 200 Ω	-	-	-	

		Black (+)					
		SC-P2	FT-N	SC-U	SC-V	SC-W	
Red (-)	SC-P2	-	-	5 - 200 Ω	5 - 200 Ω	5 - 200 Ω	
	FT-N	-	-	8	8	8	
	SC-U	∞	5 - 200 Ω	-	-	-	
	SC-V	∞	5 - 200 Ω	-	-	-	
	SC-W	∞	5 - 200 Ω	-	-	-	

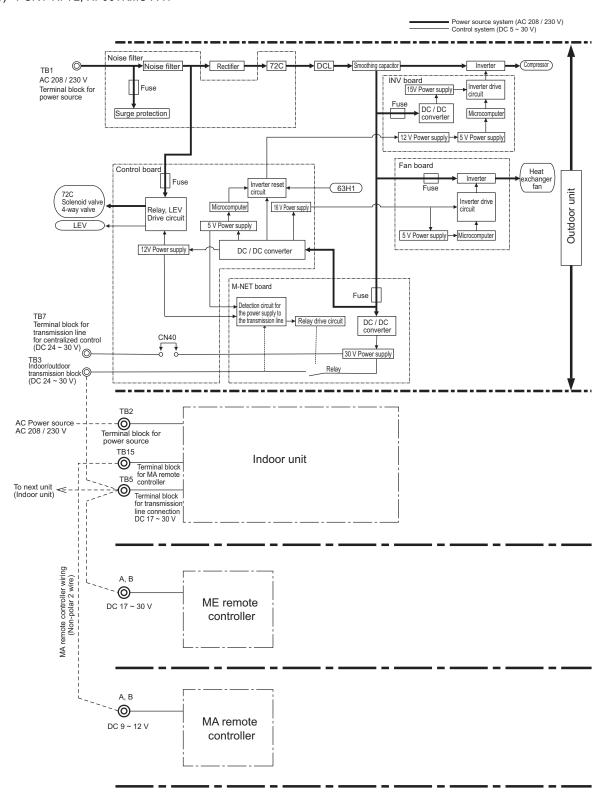
INV board external diagram



8-12 Control Circuit (TKMU)

8-12-1 Control Power Supply Function Block

1) PURY-HP72, HP96TKMU-A-H

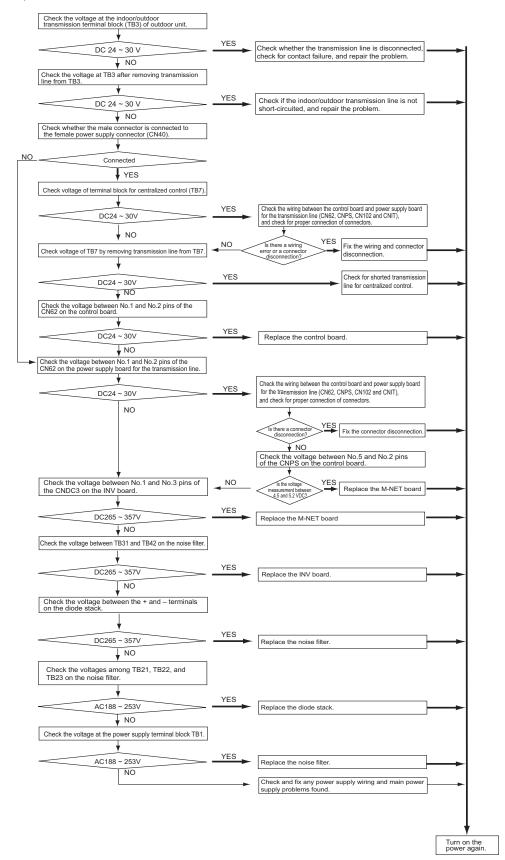


^{*} MA remote controllers and ME remote controllers cannot be used together.

(Both the ME and MA remote controller can be connected to a system with a system controller.)

8-12-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit

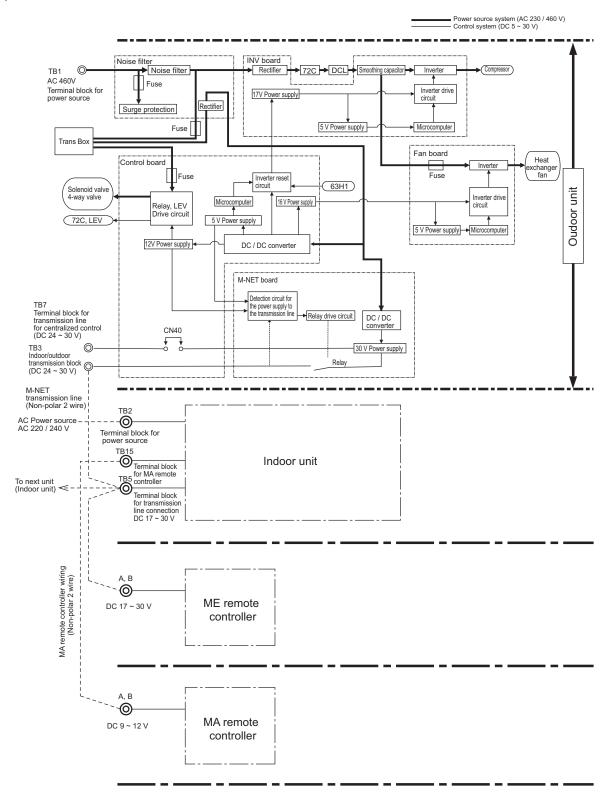
1) PURY-HP72, HP96TKMU-A-H



8-13 Control Circuit (YKMU)

8-13-1 Control Power Supply Function Block

1) PURY-HP72, HP96YKMU-A

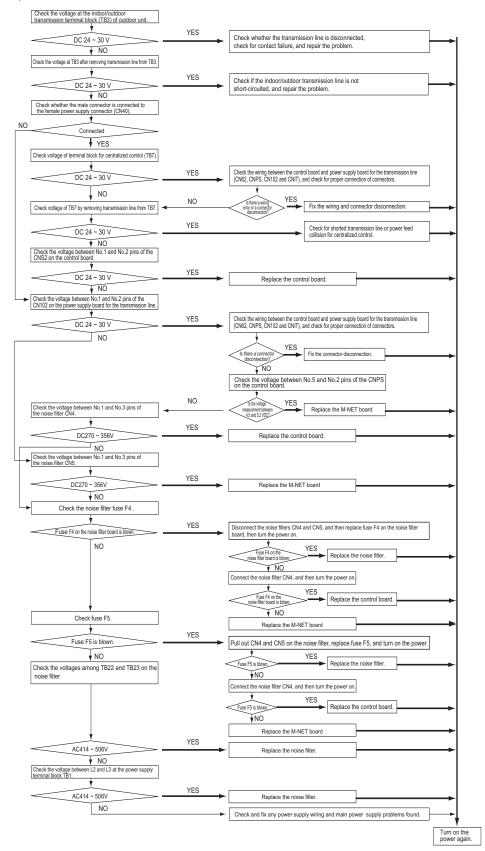


^{*} MA remote controllers and ME remote controllers cannot be used together.

(Both the ME and MA remote controller can be connected to a system with a system controller.)

8-13-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit

1) PURY-HP72, HP96YKMU-A



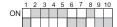
8-14 Measures for Refrigerant Leakage

- 1. Leak spot: In the case of extension pipe for indoor unit (Cooling season)
- Mount a pressure gauge on the service check joint (CJ2) on the low-pressure side.
- Stop all the indoor units, and close the high-pressure side refrigerant service valve (BV2) on the outdoor unit while the compressor is being stopped.
- Stop all the indoor units; turn on SW4 (912) on the outdoor unit control board while the compressor is being stopped. (Pump down mode will start, and all the indoor units will run in cooling test run mode.)
- 4) In the pump down mode (SW4 (912)), all the indoor units and compressors will automatically stop when the low pressure (63LS) reaches 0.383MPa [55psi] or less or 15 minutes have passed after the pump mode started. Stop all the indoor units and compressors when the pressure indicated by the pressure gauge, which is on the check joint (CJ2) for low-pressure service, reaches 0.383MPa [55psi] or 20 minutes pass after the pump down operation is started.
- 5) Close the service ball valve (BV1) on the low-pressure pipe on the outdoor unit.
- 6) Collect the refrigerant that remains in the extended pipe for the indoor unit. Do not discharge refrigerant into the atmosphere when it is collected.
- 7) Repair the leak.
- 8) After repairing the leak, vacuum*1 the extension pipe and the indoor unit.
- 9) To adjust refrigerant amount, open the ball valves (BV1 and BV2) inside the outdoor unit, and turn off SW4 (912).
- 2. Leak spot: In the case of outdoor unit (Cooling season)
- (1) Run all the indoor units in the cooling test run mode.
- 1) To run the indoor unit in test run mode, turn SW4 (769) on the outdoor unit control board to ON.
- 2) Change the setting of the remote controller for all the indoor units to the cooling mode.
- 3) Check that all the indoor units are performing a cooling operation.
- (2) Check the SC16 value.

(This value can be displayed on the LED by setting the self-diagnosis switch SW4 (SW6-10: OFF) on the outdoor unit control board.)

- 1) When SC16 is 10°C [18°F] or above: Go to the next item (3).
- 2) When the SC16 value is below 10°C [18°F]: After the compressor has stopped, extract the refrigerant in the system, repair the leak, evacuate the air from the system *1, and charge the system with refrigerant. (If the leak is in the outdoor unit, follow the same procedure as listed under "heating season.")

SC16 self-diagnosis switch



•For how to read the SW settings, refer to the following page(s). [9-1-1 How to Read the LED](page 325)

- (3) Stop all the indoor units, and stop the compressor.
- 1) To stop all the indoor units and the compressors, turn SW4 (769) on the outdoor control board from ON to OFF.
- 2) Check that all the indoor units are being stopped.
- (4) Close the ball valves (BV1 and BV2).
- (5) Collect the refrigerant that remains inside the outdoor unit.Do not discharge refrigerant into air into the atmosphere when it is collected.
- (6) Repair the leak.
- (7) After repairing the leak, replace the dryer with the new one, and perform evacuation*1 inside the outdoor unit.
- (8) To adjust refrigerant amount, open the ball valves (BV1 and BV2) inside the outdoor unit.

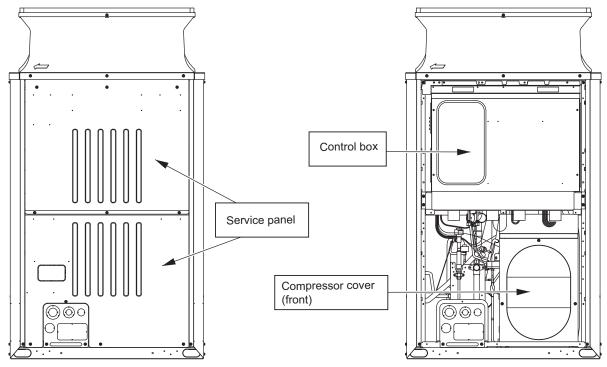
^{*1.} For details, refer to the following page(s). [1-3-3 Vacuum Drying](page 12)

- 3. Leak spot: In the case of extension pipe for indoor unit (Heating season)
- (1) Run all the indoor units in heating test run mode.
- 1) To run the indoor unit in test run mode, set SW4 (769) on the outdoor unit control board to ON.
- 2) Change the setting of the remote controller for all the indoor units to the heating mode.
- 3) Check that all the indoor units are performing a heating operation.
- (2) Stop all the indoor units, and stop the compressor.
- 1) To stop all the indoor units and the compressors, turn SW4 (769) on the outdoor control board from ON to OFF.
- 2) Check that all the indoor units are stopped.
- (3) Close the ball valves (BV1 and BV2).
- (4) Collect the refrigerant that remains inside the indoor unit. Do not discharge refrigerant into air into the atmosphere when it is collected.
- (5) Repair the leak.
- (6) After repairing the leak, perform evacuation of the extension pipe*1 for the indoor unit, and open the ball valves (BV1 and BV2) to adjust refrigerant.
- 4. Leak spot: In the case of outdoor unit (Heating season)
- Collect the refrigerant in the entire system (outdoor unit, extended pipe and indoor unit). Do not discharge refrigerant into the atmosphere when it is collected.
- 2) Repair the leak.
- 3) Repair the leak, and evacuate the air from the entire system *1. Then, calculate the proper amount of refrigerant to be added (outdoor unit + extension pipe + indoor unit), and charge the system with that amount. For details, refer to the following page(s). [6-9-3 The Amount of Refrigerant to Be Added](page 162)

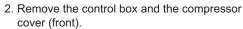
^{*1.} For details, refer to the following page(s). [1-3-3 Vacuum Drying](page 12)

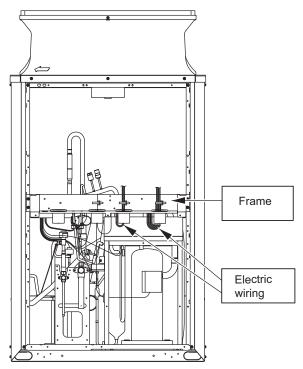
8-15 Compressor Replacement Instructions

Follow the procedures below (Steps 1 through 5) to remove the compressor components and replace the compressor. Reassemble them in the reverse order after replacing the compressor.

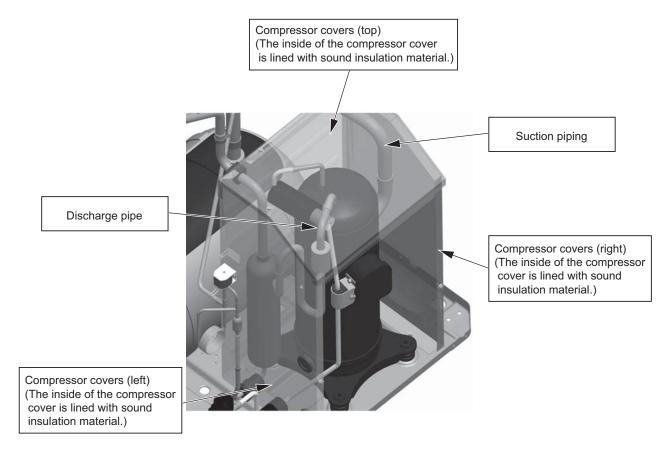


1. Remove both the top and bottom service panels (front panels).

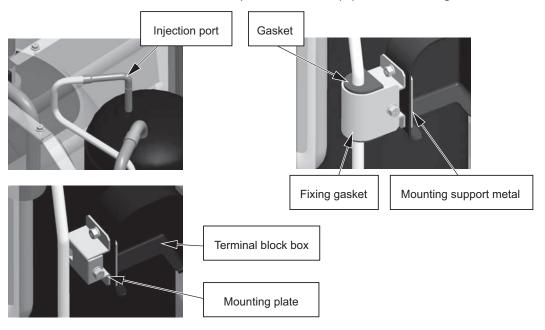




3. Remove the wires that are secured to the frame, and remove the frame.



④ Remove the compressor cover (top, left, and right), the compressor wires. When brazing the pipes, make sure that the acoustic insulation in the compressor cover and the thermal insulation on the compressor's suction pilpe are not damaged.



⑤ Remove the fixing gasket, the gasket, the mounting plate, and the mounting support metal. Then, replace the compressor after debrazing the discharge pipe, the suction pipe, and the injection pipe.

8-16 Solenoid Valve Block and Check Valve Replacement Instructions

R410A CITY MULTI H2i R2 Solenoid valve block ASSY (SV4a, SV4b, SV4d), Check valve (CV4a, CV6a, CV8a, CV9a) replacement instructions

* Following instructions show procedures for replacing service parts for Solenoid valve block ASSY (SV4a, SV4b, SV4d), Check valve (CV4a, CV6a, CV8a, CV9a). Replace them properly according to the procedures.

1. Applicable models

•PURY-HP72,96TKMU-A-H(-BS)

•PURY-HP72,96YKMU-A(-BS)

2. Parts to be serviced, Set-content

Following instructions are applicable to 1-4 service parts on the table below.

NO.	Parts to be serviced	Things required	for replacing	
NO.	Parts to be serviced	Item	Code	Numbers
		Solenoid valve block service parts set	KB00S879G20	1
4	Solenoid valve block ASSY	[Set-content]		
	(SV4a, SV4b, SV4d)	 Replacement instructions 	WT07188X01	1
		 Solenoid valve block ASSY 	KB00V126G01	1
		Service parts replacement instructions	KB00S879G14	1
2	Check valve	[Set-content]		
_	(CV4a, CV8a)	 Replacement instructions 	WT06632X01	1
		 Check valve 	P639183X01	1
		Service parts replacement instructions	KB00S879G15	1
3	Chack valve (CV6e)	[Set-content]		
3	Check valve (CV6a)	 Replacement instructions 	WT06632X01	1
		 Check valve 	P633133X01	1
		Service parts replacement instructions	KB00S879G16	1
4	Check valve (CV9a)	[Set-content]		
4	Clieck valve (CV9a)	 Replacement instructions 	WT06632X01	1
		·Check valve	P639180X01	1

3. Procedures

- *Precautions for starting replacement
 - *Check that the main power supply is OFF.
 - Check that no refrigerant is in the outdoor unit.

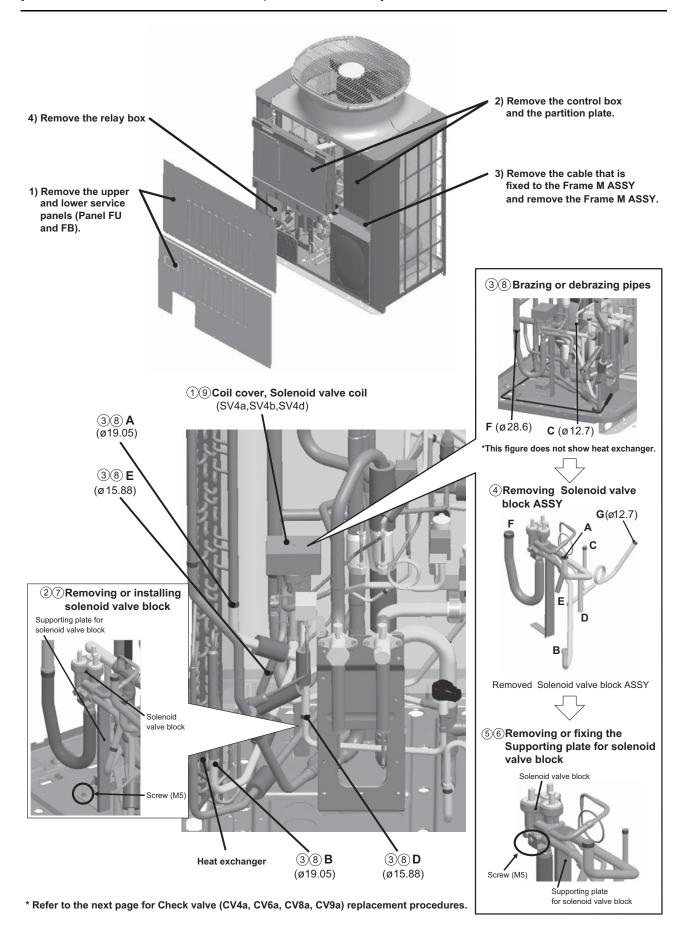
Remove each part according to the 1)-3) procedures on the figure above right before replacing service parts. Mount the removed parts back in place in a reversed procedure of 1)-3) on the figure above right after replacing service parts.

(1) Solenoid valve block ASSY (SV4a, SV4b, SV4d) replacement procedures

- To remove Solenoid valve block ASSY
- ① Remove the solenoid valve block coil cover, solenoid valve coil, and peripheral cables.
- 2 Remove the screw (M5) that fixes the supporting plate for solenoid valve block and the unit base.
- ③ Debraze A-G parts (total 7 places).
- (4) Do not damage heat exchanger fins and peripheral piping devices when removing the Solenoid valve block ASSY.
- (5) Remove the screw (M5) that fixes the solenoid valve block and the supporting plate for solenoid valve block.
- To install Solenoid valve block ASSY
 - ⑥ Fix the Solenoid valve block ASSY and the supporting plate with the fixing screw (M5).
 - ① Mount the Solenoid valve block ASSY replacement to the unit with care not to damage heat exchanger fins and peripheral piping devices. Fix the supporting plate for solenoid valve block and the unit base with the fixing screw (M5).
 - ® Braze A-G parts (total 7 places).

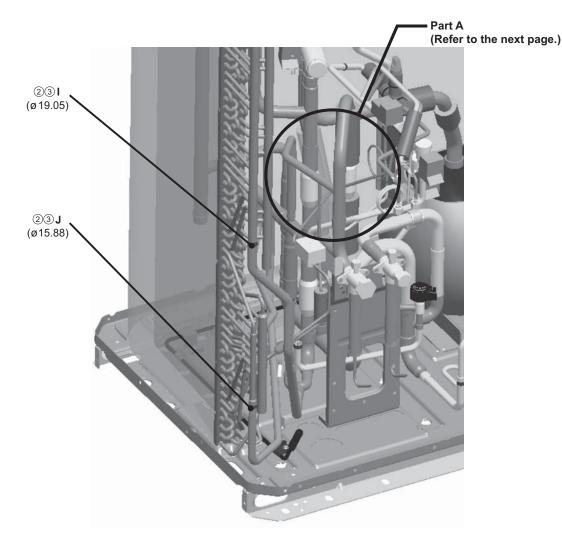
* Precautions for replacing Solenoid valve block ASSY

- Be sure to perform no-oxidation brazing when brazing.
- •Place a wet towel on the solenoid valve block when heating pipes to keep the temperature of the valve from exceeding 120°C.
- After brazing, check the condition around the brazing. After confirming no leakage, evacuate the air inside.
- Perform brazing with care of the flame direction so that it does not burn cables and plates etc. in the unit.
- •Remove the brazing part protecting heat exchanger fins from burning, and replace the service parts.



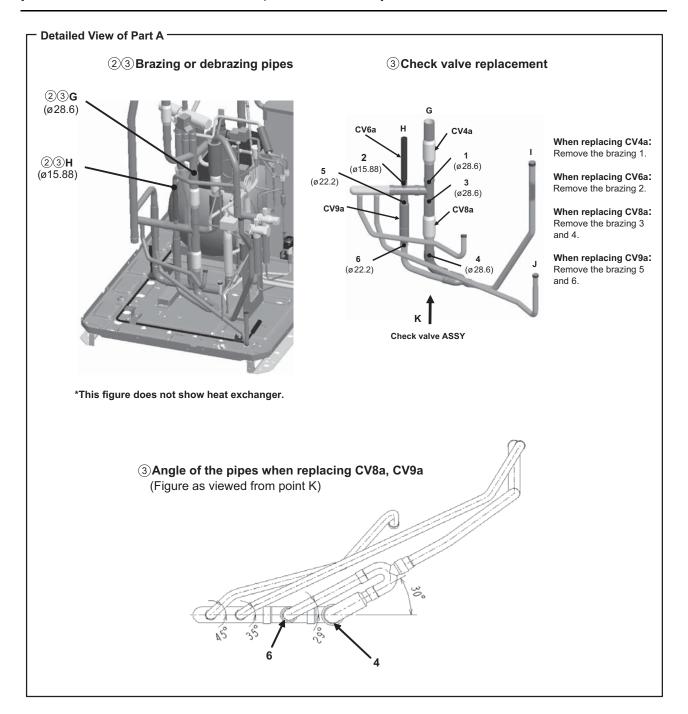
(2) Check valve (CV4a, CV6a, CV8a, CV9a) replacement procedures

- ① Remove the Solenoid valve block ASSY following "(1) Solenoid valve block ASSY (SV4a, SV4b, SV4d) replacement procedures" on the front page.
- ②Debraze G-J parts (total 4 places), and remove the Check valve ASSY.
- ③ Replace the Check valve (CV4a, CV6a, CV8a, CV9a) to be serviced while it is removed from the unit.
 Braze the pipes as they were according to the angle of the pipes on the figure below right (Figure as viewed from point K).
- 4 Mount the Solenoid valve block ASSY, coil cover, and peripheral cables back in place according to "(1) Solenoid valve block ASSY (SV4a, SV4b, SV4d) replacement procedures" on the front page.



* After removing Solenoid valve block ASSY

- * Precautions for replacing Check valve
- Be sure to perform no-oxidation brazing when brazing.
- Place a wet towel on the Check valve when heating pipes to keep the temperature of the valve from exceeding 120°C.
- · After brazing, check the condition around the brazing. After confirming no leakage, evacuate the air inside.
- Perform carefully with the flame direction so that it does not burn cables and plates etc. in the unit.
- · Remove the brazing part protecting heat exchanger fins not to be burn, and replace the service parts.



8-17 BC Controller Maintenance Instructions

1. Service panel

*Special care must be taken when replacing heavy parts.

Work procedure	Explanatory figure
1) Remove the two lock nuts on the control box, loosen the other two, and remove the control box. 2) Remove the three fixing screws on the service panel, and remove the service panel. 3) Remove the nine machine screws on the ceiling panel, and remove the ceiling panel.	Loosen Service panel Ceiling panel Control Box

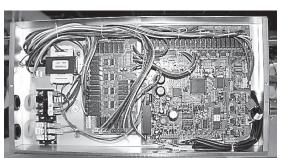
2. Control box

(1) To check the inside of the control box, remove the two lock nuts on the control box cover.

- 1) Check the terminal connection of the power wire or of the transmission line.
- 2) Check the transformer.
- 3) Check the address switch.
- (2) When the control board is replaced, the followings must be noted.
- (1) Check that the board type is G,GA (HA), or GB (HB).
- (2) Check that the wire and the connector are properly connected.

Note

It is not required to remove the two fixing screws on the control box when checking the inside.



Explanatory figure

CMB-1016NU-G, GA, HA

3. Thermistor (liquid pipe/gas pipe temperature detection)

*Special care must be taken when replacing heavy parts.

Work procedure Explanatory figure (1) Remove the service panel. 1) For TH11, TH12, and TH15, refer to 1. 1), 2). 2) For TH16, refer to 1. 1), 2), 3). (GA type only) (2) Remove the lead wire of the piping sensor from the TH16 control board. 1) TH11,TH12 (CN10) 2) TH15,TH16 (CN11) (3) Pull out the temperature sensor from the temperature sensor housing, and replace the temperature sensor with the new one. (4) Connect the lead wire of the temperature sensor securely on the control board. TH15 TH12 CMB-1016NU-GA

4. Pressure sensor

(1) Remove the service panel.
1) For the pressure sensors PS1 and PS3, refer to 1. 1), 2). (2) Remove the pressure sensor connector in trouble from the control board, and insulate the connector. 1) Liquid-side pressure sensor (CNP1) 2) Intermediate-part pressure sensor (CNP3) (3) Attach a new pressure sensor to the place which is shown in the figure, and insert the connector to the control board. Note When gas leaks from the pressure sensor, repair the leak, and follow the instructions above if required.

5. LEV

(1) Remove the service panel. (See figure at right.) (2) Replace the LEV in trouble. Note Secure enough service space in the ceiling for welding operation, and conduct the work carefully. If required, dismount the unit from the ceiling, and conduct the work. SVM2 SVM2b

6. Solenoid valve

*Special care must be taken when replacing heavy parts.

Work procedure	Explanatory figure
(1) Remove the service panel. (See figure at right.) (2) Remove the connector of the solenoid valve in trouble.	Double-pipe heat exchanger
 (3) Remove the solenoid valve coil. 1) The coils on the solenoid valves SVA, SVB, SVM1, SVM1b, SVM2, and SVM2b can be serviced through the inspection door. SVC is accessible for replacement by removing the four mounting screws on the rear panel and removing the panel (if enough space is available on the back). (SVM1 is present only on the G, GA, and HA types, SVM2 on the GA and HA types, and SVM1b and SVM2b on the HA type.) 	Solenoid valve
	CMB-1016NU-G
	CMB-1016NU-GA

8-18 Troubleshooting Problems Using the LED Status Indicators on the Outdoor Unit

If the LED error display appear as follows while all the SW4 switches and SW6-10 are set to OFF, check the items under the applicable item numbers below.

1. Error code appears on the LED display.

Refer to the following page(s). [7-1 Error Code and Preliminary Error Code Lists](page 175)

2. LED is blank.

Take the following troubleshooting steps.

- (1) Refer to the section on troubleshooting the transmission power supply circuit, if the voltage across pins 1 through 3 of CNDC on the control panel is outside the range between 220 VDC and 380 VDC.
 - [8-12-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 308)
 - [8-13-2 Troubleshooting Problems with Outdoor Unit Transmission Power Supply Circuit](page 310)
- (2) If the LED error display becomes lit when the power is turned on with all the connectors on the control board except CNDC disconnected, there is a problem with the wiring to those connectors or with the connectors themselves.
- (3) If nothing appears on the display under item (2) above AND the voltage between pins 1 and 3 of CNDC is within the range between 220 VDC and 380 VDC, control board failure is suspected.
- 3. Only the software version appears on the LED display.
- (1) Only the software version appears while the transmission cables to TB3 and TB7 are disconnected.
- 1) Wiring failure between the control board and the transmission line power supply board.(CN62, CNPS, CNIT, CNS2, CN102)
- 2) If item 1) checks out OK, the transmission line power supply board failure is suspected.
- 3) If items 1) and 2) check out OK, control board failure is suspected.
- (2) If the LED shows the same display as the initial display upon disconnection of transmission lines (TB3, TB7), there is a problem with the transmission lines or with the connected devices. [9-1-2 Initial LED Display](page 326)

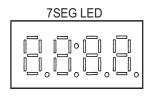
Chapter 9 LED Status Indicators on the Outdoor Unit Circuit Board

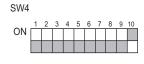
9-1	LED Status Indicators	325
9-1-1	How to Read the LED	325
9-1-2	Initial LED Display	326
9-1-3	Clock Memory Function	327
9-2	LED Status Indicators Table	328

9-1 LED Status Indicators

9-1-1 How to Read the LED

By setting the DIP SW 4-1 through 4-10 (Set SW6-10 to OFF.)(Switch number 10 is represented by 0), the operating condition of the unit can be monitored on the service monitor. (Refer to the table on the following pages for DIP SW settings.) The service monitor uses 4-digit 7-segment LED to display numerical values and other types of information.





- •SW4-10 is set to "0" on the LED Status Indicators Table.
- •In the example above, 1 through 9 are set to OFF, and 10 is set to ON.

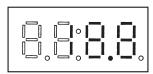
Pressure and temperature are examples of numerical values, and operating conditions and the on-off status of solenoid valve are examples of flag display.

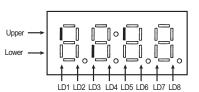
- 1) Display of numerical values
 - Example: When the pressure data sensor reads 18.8kg/cm² (Item No. 58)
 - •The unit of pressure is in kg/cm²
 - Use the following conversion formula to convert the displayed value into a value in SI unit.

Value in SI unit (MPa) = Displayed value (kg/cm²) x 0.098

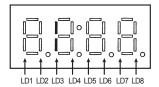
2) Flag display

Example: When 21S4a and SV1a are ON. (Item No. 3)





Example: 3-minutes restart mode (Item No. 14)



9-1-2 Initial LED Display

From power on until the completion of initial settings, the following information will be displayed on the monitor screen. (Displays No. 1 through No. 4 in order repeatedly.)

No	Item	Display	Remarks
1	Software version	8888	[0103] : Version 1.03
2	Refrigerant type		[410] : R410A
3	Model and capacity		[H-20]: Cooling/Heating 20 HP For the first few minutes after power on, the capacity of each outdoor unit is displayed. Thereafter, the combined capacity is displayed.
4	Communication address		[51]: Address 51

After the initial settings have been completed, the information on these items can be checked by making the switch setting that corresponds to No. 517 in the LED display table.

Note

Only item No. 1 "Software Version" appears on the display if there is a wiring failure between the control board and the transmission line power supply board or if the circuit board has failed.

9-1-3 Clock Memory Function

The outdoor unit has a simple clock function that enables the unit to calculate the current time with an internal timer by receiving the time set by the system controller, such as AG-150A.

If an error (including a preliminary error) occurs, the error history data and the error detection time are stored into the service memory.

The error detection time stored in the service memory and the current time can be seen on the service LED.

Note

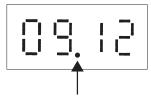
- 1) Use the time displayed on the service LED as a reference.
- 2) The date and the time are set to "00" by default. If a system controller that sets the time, such as AG-150A is not connected, the elapsed time and days since the first power on will be displayed.
 - If the time set on a system controller is received, the count will start from the set date and the time.
- 3) The time is not updated while the power of the indoor unit is turned off. When the power is turned off and then on again, the count will resume from the time before the power was turned off. Thus, the time that differs the actual time will be displayed. (This also applies when a power failure occurs.)

The system controller, such as AG-150A, adjusts the time once a day. When the system controller is connected, the time will be automatically updated to the correct current time after the time set by the system controller is received. (The data stored into the memory before the set time is received will not be updated.)

(1) Reading the time data:

1) Time display

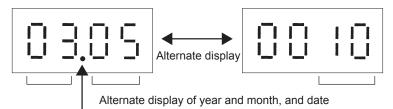
Example: 12 past 9



* Disappears if the time data is deviated due to a power failure, or if a system controller that sets the time is not connected.

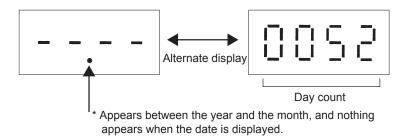
2) Date display

•When the main controller that can set the time is connected Example: May 10, 2003



* Appears between the year and the month, and nothing appears when the date is displayed.

•When the main controller that can set the time is not connected Example: 52 days after power was turned on



Remarks

SO

00

LD8

Unit (A, B) *1

⋖

⋖

CPU in oper-ation

В

В

LED Status Indicators Table

		PD9		ighted)	ighted)	ighted)			SV4d					
	Display	FD5	72C	0000 to 9999 (Address and error codes highlighted)	0000 to 9999 (Address and error codes highlighted)	0000 to 9999 (Address and error codes highlighted)	SV1a					0000 to 9999	0000 to 9999	havelusib
	Dis	LD4		99 (Address ar	99 (Address ar	99 (Address ar		SV5b				0000 t	0000 t	srant evetem is
		FD3		0000 to 99	0000 to 99	0000 to 99								antire refrice
		LD2					SV10		SV4b		Emergency			+ Jo notition of +
		LD1	Comp in op- eration				21S4a		SV4a		Retry opera- tion			of either OC or OS is displayed individually. B: The condition of the entire refrinerant system is displayed
	ltem		ıt display 1	r) display 1 ır	Check (error) display 2 OC/OS error	Check (error) display 3 (Including IC and BC)	Тор	Bottom	Тор	Bottom	trol	tion de-	nt demand	a dienlayed in
	a)		Relay output display 1 Lighting	Check (error) display 1 OC/OS error	Check (error) OC/OS error	Check (error) display (Including IC and BC)	Relay out-	putuispiay 2	Relay out- putdisplay 3		Special control	Communication de- mand capacity	Contact point demand capacity	or OC
t data	SW4 (When SW6 - 10 is set to OFF)	1234567890	000000000		1000000000	0100000000	000000044	00000001	0010000000		1110000000	1001000000	0101000000	*1 A. The condition of eiths
Current data	Š.		c	>	-	2	c	ာ	4		7	6	10	*1 A· Th

If no errors are detected, "----" appears on the display.

В

⋖

⋖

SV11

⋖

⋖

Power supply for indoor transmission line

liminary error If no preliminary errors are detected, "---" ap-Display of the latest pre-

⋖

⋖

pears on the display.

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

If not demanded controlled, "---" [%] appears on the display.

В

If not demanded controlled, "---" [%] ap-

В

В

В

В

tion error 3-minute re-start delay Communicapears on the display.

9-7

9 LED Status Indicators on the Outdoor Unit Circuit Board

,		١	1
	i	1	5
•	i	ï	j
	Š		
	(1)
	1		
	:		1
	i	•	١
١	۰		•

Curre	Current data	-	•								-		}	
Š.	SW4 (When SW6- 10 is set to OFF)	Item					Disp	Display				Unit (A, B) *1	it _*1	Remarks
	1234567890	T	•	LD1	LD2	FD3	LD4	FD5	9G7	LD7	PD8	00	SO	
7	1101000000	External signal (Open input contact point)		Contact point de- mand	Low-noise mode (Capacity priority)	Snow sensor						∢	∢	
72	0011000000	External signal (Open input contact point)	l ontact								Low-noise mode (Quiet priori- ty)	∢	∢	
13	1011000000													
4	0111000000	Outdoor unit operation status	peration	BC opera- tion signal	Warm-up mode	3-minutes restart mode	Compressor in operation	Preliminary error	Error	3-minutes restart after instanta- neous power failure	Preliminary low pres- sure error	∢	∢	
15	1111000000	OC/OS identification	cation				OC	so/oo				∢	∢	
4	00000	unit	Тор	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5	Unit No. 6	Unit No. 7	Unit No. 8	В		The lamp that corre-
2	00000	check	Bottom	Unit No. 9	Unit No. 10	Unit No. 11	Unit No. 12	Unit No. 13	Unit No. 14	Unit No. 15	Unit No. 16			sponds to the unit that came to an abnormal stop
7	1000100000	ļÉ.	Тор	Unit No. 17	Unit No. 18	Unit No. 19	Unit No. 20	Unit No. 21	Unit No. 22	Unit No. 23	Unit No. 24			lights. The lamp goes off when
=		Ø.	Bottom	Unit No. 25	Unit No. 26	Unit No. 27	Unit No. 28	Unit No. 29	Unit No. 30	Unit No. 31	Unit No. 32			the error is reset.
ά,	040040000	Ĕ.	Тор	Unit No. 33	Unit No. 34	Unit No. 35	Unit No. 36	Unit No. 37	Unit No. 38	Unit No. 39	Unit No. 40			Each unit that comes to an abnormal unit will be
2	0000	В	Bottom	Unit No. 41	Unit No. 42	Unit No.43	Unit No. 44	Unit No. 45	Unit No. 46	Unit No. 47	Unit No. 48			given a sequential num-
6	1100100000	F _	Тор	Unit No. 49	Unit No. 50									starting with 1.
2		В	Bottom											
2	00101010000		Тор	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5	Unit No. 6	Unit No. 7	Unit No. 8	В		Lit during cooling
2		Uperation B. mode	Bottom	Unit No. 9	Unit No. 10	Unit No. 11	Unit No. 12	Unit No. 13	Unit No. 14	Unit No. 15	Unit No. 16			Binking during heating Unlit while the unit is
27	10101010000	Ľ.	Тор	Unit No. 17	Unit No. 18	Unit No. 19	Unit No. 20	Unit No. 21	Unit No. 22	Unit No. 23	Unit No. 24			stopped or in the fan
i		В	Bottom	Unit No. 25	Unit No. 26	Unit No. 27	Unit No. 28	Unit No. 29	Unit No. 30	Unit No. 31	Unit No. 32			
22	0110100000	Ĕ	Тор	Unit No. 33	Unit No. 34	Unit No. 35	Unit No. 36	Unit No. 37	Unit No. 38	Unit No. 39	Unit No. 40			
1		8	Bottom	Unit No. 41	Unit No. 42	Unit No.43	Unit No. 44	Unit No. 45	Unit No. 46	Unit No. 47	Unit No. 48			
23	1110100000	Ĕ	Тор	Unit No. 49	Unit No. 50									
1		<u>a</u>	Bottom											
*1 A: T	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	her OC or OS is d	lisplayed in	dividually, B. Th	ondition of	the entire refrigerant system is displayed	srant evetem is	heyeldel						

HWE13080 - 329 -

Current data

Current data	t data														
No.	SW4 (When SW6- 10 is set to OFF)	#	ltem				Display	olay				Unit (A, B) *1	iit 3) *1	Remarks	
	1234567890		_	LD1	LD2	LD3	LD4	FD5	9Q7	LD7	PD8	00	SO		
24	0000110000	Indoorunit	Тор	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5	Unit No. 6	Unit No. 7	Unit No. 8	В		Lit when thermostat is on	
<u> </u>	0000	thermo- stat	Bottom	Unit No. 9	Unit No. 10	Unit No. 11	Unit No. 12	Unit No. 13	Unit No. 14	Unit No. 15	Unit No. 16			Unlit when thermostat is off	
25	100110000	T	Тор	Unit No. 17	Unit No. 18	Unit No. 19	Unit No. 20	Unit No. 21	Unit No. 22	Unit No. 23	Unit No. 24				
3	0000		Bottom	Unit No. 25	Unit No. 26	Unit No. 27	Unit No. 28	Unit No. 29	Unit No. 30	Unit No. 31	Unit No. 32				
90	0400000	T	Тор	Unit No. 33	Unit No. 34	Unit No. 35	Unit No. 36	Unit No. 37	Unit No. 38	Unit No. 39	Unit No. 40				
- <u>-</u>	00000		Bottom	Unit No. 41	Unit No. 42	Unit No.43	Unit No. 44	Unit No. 45	Unit No. 46	Unit No. 47	Unit No. 48				
76	110110000	T	Тор	Unit No. 49	Unit No. 50										
7	0000		Bottom												
37	1010010000	BC operation mode	on mode	Cooling-only ON	Cooling-only OFF	Heating-only ON	Heating-only OFF	Mixed-mode ON	Mixed-mode OFF	Fan	Stop	В			
39	1110010000	Outdoor un mode	Outdoor unit Operation mode	Permissible stop	Standby	Cooling	Cooling- main	Heating	Heating- main			∢	∢		
42	0101010000	Outdoor unit control mode	nit control	Stop	Thermo OFF	Abnormal stop	Scheduled	Initial start up	Defrost	Oil balance	Low fre- quency oil recovery	∢	⋖		
43	1101010000			Warm-up mode	Refrigerant recovery			ON-defrost 2	ON-defrost 1			٧	⋖		
45	1011010000	TH4					-99.9 tc	.99.9 to 999.9				A	∢	The unit is [°C]	
47	1111010000	TH7					-99.9 tc	-99.9 to 999.9				4	⋖		
48	0000110000	ТН6					-99.9 tc	.99.9 to 999.9				∢	∢		
20	0100110000	TH5					-99.9 tc	-99.9 to 999.9				٧	⋖		
25	0110110000	ТН9					-99.9 tc	.99.9 to 999.9				٧	⋖		
99	0001110000	THHS1					-99.9 tc	.99.9 to 999.9				∢	∢	The unit is [°C]	
28	0101110000	High-pressure sensor data	ure sensor				-99.9 tc	.99.9 to 999.9				∢	∢	The unit is [kgf/cm²]	
29	1101110000	Low-pressure sensor data	ure sensor				-99.9 tc	99.9 to 999.9				∢	∢		
63	1111110000	TH11					-99.9 tc	.99.9 to 999.9				٧	∢		
78	0111001000	Σαj					0000 tc	0000 to 9999				А	Α		
62	1111001000	∑ Qjc					0000 to 9999	6666 с				А	∢		
*1 A: Th	*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.	er OC or OS	is displayed ir	ndividually. B: Th	he condition of t	the entire refrige	rant system is	displayed.							_

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

9 LED Status Indicators on the Outdoor Unit Circuit Board

	(U
	٠	-
	(U
•	7	3
	7	_
		_
	c	Ľ
		_
		_
	ï	•
١	L	J

Cur	Current data													
S	SW4 (When SW6- 10 is set to OFF)	r) Item				Dis	Display				Unit (A, B) *1	- *-	Remarks	
	1234567890	C	LD1	LD2	FD3	LD4	FD5	9G7	LD7	PD8	00	SO		
80	0000101000	0 ∑ Qjh				0000 t	0000 to 9999				∢	۷		
81	1000101000	0 Target Tc				-99.9 te	99.9 to 999.9				В		The unit is [°C]	
82	0100101000	0 Target Te				-99.9 te	-99.9 to 999.9				В			
83	1100101000	0 Tc				-99.9 te	-99.9 to 999.9				4	۷		
8	. 0010101000	0 Te				-99.9 t	.99.9 to 999.9				4	۷		
98	0110101000	Total frequencies (OC+OS)				0000 t	0000 to 9999				В		Control data [Hz]	
87	1110101000	Total frequency of each unit				0000 t	0000 to 9999				∢	∢		
88	0001101000	0 COMP frequency				0000 t	0000 to 9999				٧	4		
6	1101101000	COMP operating frequency				0000 t	0000 to 9999				∢	∢	The unit is [rps]Output frequency of the inverter depends on the type of compressor and equals the integer multiples (x1, x2 etc.) of the operating frequency of the compressor.	
92	0011101000	Number of times error occurred during crank-case heating by compressor motor				0000 t	0000 to 9999				4	∢	Number of times INV error occurred during IH crankcase heating by compressor motor	
93	1011101000	0 All AK (OC+OS)				0000 t	0000 to 9999				В			
94	. 0111101000	0 AK				0000 t	0000 to 9999				∢	4		
92	1111101000	0 FAN1				0000 t	0000 to 9999				∢	∢	Fan output [%]	
96	000011000	D Fan inverter output rpm (FAN1)				0000 t	0000 to 9999				4	∢	[mbu]	
101	1010011000	0 LEV5a				0000 t	0000 to 9999				∢	∢		
105	5 1001011000	0 LEV4				0000 t	0000 to 9999				∢	∢		
108	8 0011011000	COMP operating current (DC)				00.0 tc	00.0 to 999.9				4	∢	Peak value[A]	
111	1111011000	COMP bus voltage				00.0 tc	00.0 to 999.9				٧	٨	The unit is [V]	
*1 A	: The condition of 6	*1 A. The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.	ndividually. B: T	he condition of	the entire refrige	erant system is	displayed.							

Current data

ourrent data	uala													
S	SW4 (When SW6 - 10 is set to OFF)	Item	ε				Disp	Display				Unit (A, B) *1	it)*1	Remarks
	1234567890	1		LD1	LD2	FD3	LD4	FD5	9Q7	LD7	FD8	20	SO	
116	00010111000	Number of times the unit went into the mode to remedy wet vapor suction	mes the o the mode et vapor				¹ 0000	0000 to 9999				Ф		
117	1010111000	COMP Operation time Upper 4 digits	ation time				0000 tc	0000 to 9999				∢	∢	The unit is [h]
118	0110111000	COMP Operation time Lower 4 digits	ation time				0000 tc	0000 to 9999				∢	∢	
121	1001111000	Backup mode	<u>ə</u>	Abnormal pressure rise	High-pres- sure drop	Low-pres- sure drop	Abnormal Td rise	High-pres- sure during defrost cycle	Control box temperature rise			∢	∢	Stays lit for 90 seconds after the completion of backup control
123	1101111000	COMP number of start- stop events Upper 4 digits	oer of start-) 0000 tr	0000 to 9999				∢	∢	Count-up at start-up The unit is [Time]
124	0011111000	COMP number of start- stop events Lower 4 digits	oer of start- ts				0000 tr	0000 to 9999				∢	∢	
129	1000000100	Integrated operation time of compressor (for rotation purpose)	peration pressor (for lose)) 0000 tr	0000 to 9999				В		The unit is [h]
132	0010000100	Relay out- putdisplay – BC(Main)	Top Bottom	SVM1	SVM2	SVM1b	SVM2b					В	•	
133	1010000100	<u> </u>	Top Bottom	SVA1 SVA3	SVB1 SVB3	SVC1 SVC3	SVA2 SVA4	SVB2 SVB4	SVC2 SVC4			Ф	•	
134	0110000100		Top Bottom	SVA5 SVA7	SVB5 SVB7	SVC5 SVC7	SVA6 SVA8	SVB6 SVB8	SVC6 SVC8			Ф		
135	1110000100	ı	Top Bottom	SVA9 SVA11	SVB9 SVB11	SVC9 SVC11	SVA10 SVA12	SVB10 SVB12	SVC10 SVC12			В		
136	0001000100	<u> </u>	Top	SVA13	SVB13	SVC13	SVA14	SVB14	SVC14			В	•	
1 A: Th	condition of eithe	er OC or OS is	displayed in	14. The condition of either OC or OS is displayed individually. B. The condition of the entire refricerant system is displayed	OVB13	the entire refrice	erant system is a	displayed.	91000					

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

_
52
ā
0
-
\Box
ė
╘
3
Ō
_

Curre	Current data													
N	SW4 (When SW6- 10 is set to OFF)	#	ltem				Display	olay				Unit (A, B) *1	<u>*</u>	Remarks
	1234567890			LD1	LD2	FD3	LD4	FD5	9G7	LD7	PD8	00	SO	
138	01000100	Relay out-	Тор	SVA1	SVB1	SVC1	SVA2	SVB2	SVC2			α		
2		BC(Sub1)	Bottom	SVA3	SVB3	SVC3	SVA4	SVB4	SVC4			ם	<u> </u>	
130	1101000100	T	Тор	SVA5	SVB5	SVC5	SVA6	SVB6	SVC6			α		
2			Bottom	SVA7	SVB7	SVC7	SVA8	SVB8	SVC8			ם	<u> </u>	
7	70007	ı	Тор	SVA9	SVB9	SVC9	SVA10	SVB10	SVC10			٥		
<u>4</u>			Bottom	SVA11	SVB11	SVC11	SVA12	SVB12	SVC12			۵	<u> </u>	
7	700007	ı	Тор	SVA13	SVB13	SVC13	SVA14	SVB14	SVC14			۵		
<u> </u>			Bottom	SVA15	SVB15	SVC15	SVA16	SVB16	SVC16			ם	<u> </u>	
4 4 3 3	77	Relay out-	Тор	SVA1	SVB1	SVC1	SVA2	SVB2	SVC2			a		
1		putdisplay BC(Sub2)	Bottom	SVA3	SVB3	SVC3	SVA4	SVB4	SVC4			۵	<u> </u>	
7	000040000	1	Тор	SVA5	SVB5	SVC5	SVA6	SVB6	SVC6			α		
<u> </u>			Bottom	SVA7	SVB7	SVC7	SVA8	SVB8	SVC8			ם	<u> </u>	
145	10004	1	Тор	SVA9	SVB9	SVC9	SVA10	SVB10	SVC10			α		
<u>}</u>			Bottom	SVA11	SVB11	SVC11	SVA12	SVB12	SVC12			ם	<u> </u>	
77	0400400	ı	Тор	SVA13	SVB13	SVC13	SVA14	SVB14	SVC14			٥		
5	0010010		Bottom	SVA15	SVB15	SVC15	SVA16	SVB16	SVC16			۵	<u> </u>	
149	1010100100	BC(Main or standard) TH11	r standard)				-99.9 to 999.9	6.666				В		
150	0110100100	BC(Main)TH12	H12				-99.9 to 999.9	6.666				В		
151	1110100100	BC(Main)TH15	H15				-99.9 to 999.9	6.666				В		
152	0001100100	BC(Main)TH16	H16				-99.9 to 999.9	6.666.0				В		
153	1001100100	BC(Main)63HS1	3HS1				-99.9 to 999.9	6.666				В		
154	0101100100	BC(Main)63HS3	3HS3				-99.9 to 999.9	6.666 0				В		
155	1101100100	BC(Main)SC11	C11				-99.9 to 999.9	6.666				В		
156	0011100100	BC(Main)SH12	H12				-99.9 to 999.9	6.666.0				В		
157	1011100100	BC(Main)SH13	;H13				-99.9 to 999.9	6.666 0				В		
158	0111100100	BC(Main)SC16	1016				-99.9 to 999.9	6.666				В		
*1 A: T	*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.	er OC or OS	is displayed ir	ndividually. B: Th	ne condition of t	he entire refrige	rant system is c	displayed.						

- 333 -

Current data

No.	SW4 (When SW6- 10 is set to OFF)	ltem				Dis	Display				Unit (A, B) *1	iit :) *1	Remarks	
•	1234567890		LD1	LD2	FD3	LD4	FD5	9U7	LD7	FD8	00	SO		
159	1111100100	BC(Main)LEV1				1 0000 tr	0000 to 2000				В		LEV1 opening (Fully open:2000)	1
160	0000010100	BC(Main)LEV3				0000 tr	0000 to 2000				В		LEV3 opening (Fully open:2000)	
161	1000010100	BC(Sub1)TH12				-99.9 tc	-99.9 to 999.9				В			
162	0100010100	BC(Sub1)TH15				-99.9 tc	-99.9 to 999.9				В			
163	1100010100	BC(Sub1)LEV3				0000 t	0000 to 2000				В		LEV3 opening (Fully open:2000)	ı
164	0010010100	BC(Sub2)TH12				-99.9 tc	-99.9 to 999.9				В			
165	1010010100	BC(Sub2)TH15				-99.9 tc	-99.9 to 999.9				В			
166	01100100	BC(Sub2)LEV3				0000 tr	0000 to 2000				В		LEV3a opening (Fully open:2000)	
167	1110010100	BC(Main)LEV2				0000 tr	0000 to 2000				В		LEV2 opening (Fully open:2000)	
1 A· Th	a condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of the	T.A Vilariority B. T	he condition of		entire refriderant system is displayed	displayed							1

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

~
뜓
<u>6</u>
-
ᆵ
Φ
╘
3
ပ

1.00 set to .0.176 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00											Unit	ıit	
Etror history 1 Etror history 1 Etror details of inverter Etror details	10 is set to OFF)					Dis	play				(A, E	3)*1	Remarks
Error details of inverter Error details of inverter Error details of inverter A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A	1234567890		LD1	LD2	FD3	LD4	FD5	9 0 7	LD7	8G7	00	SO	
Error details of inverter Error details of inverter A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A <th< td=""><td>0100110100</td><td>Error history 1</td><td></td><td></td><td></td><td>0000 t</td><td>6666 o</td><td></td><td></td><td></td><td>В</td><td>В</td><td>Address and error codes</td></th<>	0100110100	Error history 1				0000 t	6666 o				В	В	Address and error codes
Error details of inverter Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter A A Error details of inverter 0000 to 9999 B B Error details of inverter 0000 to 9999 B B Error history 5 Error details of inverter 0000 to 9999 B B Error details of inverter Error details of inverter 0000 to 9999 B B B Error details of inverter Error details of inverter Error details of inverter A A A Error details of inverter Error details of inverter Error details of inverter B B B Error details of inverter Error details of inverter Error details of inverter A A A Error details of inverter Error details of inverter Error details of inverter B B B Error details of inverter Error details of inverter Error details of inverter	1100110100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			∢	Α	nighlighted If no errors are detected,
Error details of inverter Error details of inverter (0001-0120) A A A Error details of inverter Error details of inverter (0000-10120) A A A Error details of inverter Error details of inverter (0001-0120) B B B Error details of inverter Error details of inverter (0001-0120) A A A Error details of inverter Error details of inverter (0001-0120) B B B Error details of inverter Error details of inverter (0001-0120) A A A Error details of inverter Error details of inverter (0001-0120) B B B Error details of inverter Error details of inverter (0001-0120) A A A Error details of inverter Error details of inverter (0001-0120) A A A Error details of inverter Error details of inverter (0001-0120) A A A Error details of inverter Error details of inverter (0001-0120) A A A Error details of inverter Error details of inverter (0001-0120) B	0010110100	Error history 2				0000 t	6666 o				В	В	" " appears on the dis-
Error details of inverter Error details of inverter A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A <th< td=""><td>1010110100</td><td>Error details of inverter</td><td></td><td></td><td>Ш</td><td>rror details of inv</td><td>verter (0001-01</td><td>20)</td><td></td><td></td><td>∢</td><td>Α</td><td>Preliminary error informa-</td></th<>	1010110100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			∢	Α	Preliminary error informa-
Error details of inverter Error details of inverter Error details of inverter A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A	0110110100	Error history 3				0000 t	6666 o				В	В	tion of the OS does not appear on the OC.
Error thistory 4 Error details of inverter Error details of inverter A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A </td <td>1110110100</td> <td>Error details of inverter</td> <td></td> <td></td> <td>Ш</td> <td>rror details of inv</td> <td>verter (0001-01</td> <td>20)</td> <td></td> <td></td> <td>∢</td> <td>Α</td> <td>Neither preliminary error</td>	1110110100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			∢	Α	Neither preliminary error
Error details of inverter Error details of inverter A A A A Error history 5 Error details of inverter Error details of inverter 00000 to 9999 A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A	0001110100	Error history 4				0000 t	6666 o				В	В	error information of the IC
Error history 5 Error details of inverter Error details of inverter A Error history 6 Error history 6 A Error history 7 Error details of inverter Error details of inverter A Error history 8 Error details of inverter Error details of inverter A Error history 8 Error details of inverter A Error history 9 Error details of inverter A Error details of inverter Error details of inverter Error details of inverter A Error history 10 Error details of inverter Error details of inverter (0001-0120) A Error details of inverter Error details of inverter (0001-0120) A Error details of inverter Error details of inverter (0001-0120) A Error details of inverter Error details of inverter (0001-0120) A Error details of inverter Error details of inverter Error details of inverter A	1001110100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			4	A	appears on the OS.
Error details of inverter Error details of inverter Error details of inverter A A Error history 6 Error details of inverter Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter Error details of inverter Error details of inverter A Error details of inverter Error details of inverter Error details of inverter Error details of inverter A Error history of inverter Error details of inverter Error details of inverter Error details of inverter A Error history of inverter Error details of inverter (At the time of last data backup before error) Error details of inverter (At the time of last data backup before error) A Error details of inverter A A	0101110100	Error history 5				0000 t	6666 o				В	В	
Error history 6 Error details of inverter Error details of inverter A Error details of inverter 0000 to 9999 A Error details of inverter 0000 to 9999 B Error details of inverter 0000 to 9999 A Error details of inverter Error details of inverter A Error details of inverter Error details of inverter B Error details of inverter Error details of inverter Error details of inverter Error history of inverter Error details of inverter A Error history of inverter Error details of inverter A Error details of inverter Error details of inverter A	1101110100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			4	Α	
Error details of inverter Error details of inverter A A Error history 7 Error details of inverter 0000 to 9999 B Error history 8 Error details of inverter Error details of inverter A Error details of inverter Error details of inverter A Error history 9 Error details of inverter B Error history 10 Error details of inverter Error details of inverter Error history of inverter Error details of inverter Error details of inverter (At the time of last data backup before error) Error details of inverter B Error details of inverter Error details of inverter A	0011110100	Error history 6				0000 t	6666 o				В	В	
Error history 7 Error details of inverter Error details of inverter Error details of inverter A Error history 8 Error details of inverter Error details of inverter A A Error history 9 Error details of inverter Error details of inverter Error details of inverter A A Error history 10 Error details of inverter Error details of inverter Error details of inverter A A Error history of inverter Error details of inverter Error details of inverter A B Error details of inverter Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter A A	10111110100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			∢	Α	
Error details of inverter Error details of inverter Error details of inverter A A Error history 8 Error details of inverter Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter Error details of inverter A A	0111110100	Error history 7				0000 t	6666 o				В	В	
Error history & Error details of inverter 0000 to 9999 B Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter Error details of inverter A Error history of inverter Error details of inverter A (At the time of last data backup before error) Error details of inverter B Error details of inverter Error details of inverter A	1111110100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			4	Α	
Error details of inverter Error details of inverter A A Error history 9 Error details of inverter Error details of inverter A A Error details of inverter Error details of inverter Error details of inverter A A Error history of inverter Error details of inverter Error details of inverter A A Error details of inverter (At the time of last data backup before error) Error details of inverter B B Error details of inverter Error details of inverter A A	0000001100	Error history 8				0000 t	6666 o				В	В	
Error history 9 Enror details of inverter Enror details of inverter B A Error details of inverter Error details of inverter Error details of inverter A B Error details of inverter Error details of inverter (At the time of last data backup before error) A A Error details of inverter Error details of inverter B B Error details of inverter Error details of inverter A	1000001100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			4	А	
Error details of inverter Error details of inverter Error details of inverter A Error history 10 Error details of inverter Error details of inverter Error details of inverter A Error history of inverter (At the time of last data backup before error) 0000 to 9999 B Error details of inverter Error details of inverter A	0100001100	Error history 9				0000 t	6666 o				В	В	
Error history 10 Enror details of inverter Error details of inverter (0001-0120) A Error history of inverter (At the time of last data backup before error) 0000 to 9999 B Error details of inverter Error details of inverter (0001-0120) A	1100001100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			∢	А	
Error details of inverter Error details of inverter A A Error history of inverter (At the time of last data backup before error) 0000 to 9999 B Error details of inverter Error details of inverter (0001-0120) A	00110001100	Error history 10				0000 t	6666 o				В	В	
Error history of inverter (At the time of last data backup before error) Error details of inverter Error details of inverter Error details of inverter B B B B B B B B B B B B B B B B B B B	1010001100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			∢	Α	
Error details of inverter Error details of inverter (0001-0120)	0110001100	Error history of inverter (At the time of last data backup before error)				0000 t	6666 0				В	В	
	1110001100	Error details of inverter			Ш	rror details of inv	verter (0001-01	20)			4	Α	

Data before error

Data 12	Data Delore error												
o N	SW4 (When SW6-10 is set to OFF)	ltem				Display	olay				Unit (A, B) *1	oit 3) *1	Remarks
	1234567890		LD1	LD2	FD3	LD4	FD5	9Q7	LD7	RD3	00	SO	
201	1001001100	Outdoor unit operation status	BC opera- tion signal	Warm-up mode	3-minutes restart mode	Compressor in operation	Preliminary error	Error	3-minutes restart after instanta- neous power failure	Preliminary low pres- sure error	∢	∢	
202	0101001100	OC/OS identification				SO/OO	SO				А	А	
203	1101001100	BC operation mode	Cooling-only ON	Cooling-only OFF	Heating-only ON	Heating-only OFF	Mixed-mode ON	Mixed-mode OFF	Fan	Stop	A	Α	
205	1011001100	Outdoor unit Operation mode	Permissible stop	Standby	Cooling	Cooling- main	Heating	Heating- main			٨	٧	
208	0000101100	Outdoor unit control mode	Stop	Thermo OFF	Abnormal stop	Scheduled	Initial start up	Defrost	Oil balance	Low fre- quency oil recovery	А	А	
209	1000101100		Warm-up mode	Refrigerant recovery			ON-defrost 2	ON-defrost 1			A	Α	
211	1100101100	Relay output display 1 Lighting	Comp in op- eration				72C		00	Always lit	٨	٧	
		Relay out- Top	21S4a	SV10			SV1a			SV11			
212	0010101100	putulspiay Bottom 2 Lighting				SV5b					4	А	
213	1010101100	Relay out- putdisplay 3 Lighting	SV4a	SV4b				SV4d	8N8	Lit while power to the indoor units is being sup- plied	∢	∢	
		Bottom											
216	0001101100	TH4				-99.9 to	-99.9 to 999.9				A	А	The unit is [°C]
218	0101101100	TH7				-99.9 to	-99.9 to 999.9				∢	Α	
219	1101101100	ТН6				-99.9 to	-99.9 to 999.9				Α	А	
221	1011101100	TH5				-99.9 to	.99.9 to 999.9				∢	Α	
225	1000011100	ТН9				-99.9 to 999.9	6.666 0				Α	А	
227	1100011100	THHS1				-99.9 to	-99.9 to 999.9				∢	А	
* + + + + + + + + + + + + + + + + + + +	An mailthrane	F 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		7		-;	111						

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

9 LED Status Indicators on the Outdoor Unit Circuit Board

	1		
١	c		١
	t		
	2	ı	1
	,	•	•
	ì		
	Ç)
١	ċ	ı	
	Ċ		į
			•
	ì		í
	Ç	ĺ	į
ĺ	_		١

Data D	Data belore error	-											
No.	SW4 (When SW6- 10 is set to OFF)	Item				Disk	Display				Unit (A, B) *1	it :) *1	Remarks
	1234567890	Ī	LD1	LD2	FD3	LD4	FD5	9G7	LD7	LD8	00	SO	
229	1010011100	High-pressure sensor data				-99.9 tc	-99.9 to 999.9			_	∢	٧	The unit is [kgf/cm²]
230	0110011100	Low-pressure sensor data				-99.9 tc	99.9 to 999.9				∢	٨	
234	0101011100	TH11				-99.9 tc	.99.9 to 999.9				∢	٨	
249	1001111100	Σαj				0000 tc	0000 to 9999				∢	Α	
250	0101111100	Σ Qjc				0000 tc	0000 to 9999				∢	Α	
251	1101111100	Σ Qjh				0000 tc	0000 to 9999				∢	٨	
252	0011111100	Target Tc				-99.9 tc	.99.9 to 999.9				В		The unit is [°C]
253	1011111100	Target Te				-99.9 tc	-99.9 to 999.9				В		
254	0111111100	Tc				-99.9 tc	-99.9 to 999.9				∢	٧	The unit is [°C]
255	1111111100	Te				-99.9 tc	-99.9 to 999.9				∢	٧	
257	100000010	Total frequencies (OC+OS)				0000 tc	0000 to 9999				В		Control data [Hz]
258	0100000010	Total frequency of each unit				0000 tc	0000 to 9999				٧	٨	
259	110000010	COMP frequency				0000 tc	0000 to 9999				∢	٧	
264	0000100010	All AK (OC+OS)				0000 tc	0000 to 9999				В		
265	1001000010	AK				0000 tc	0000 to 9999				∢	٧	
266	0101000010	FAN1				0000 tc	0000 to 9999				∢	Α	Fan inverter output [%]
267	1101000010	Fan inverter output rpm (FAN1)				0000 tc	0000 to 9999				٨	A	[mdɪ]
272	0000100010	LEV5a				0000 tc	0000 to 9999				4	٧	
276	0010100010	LEV4				0000 to	0000 to 9999				A	А	
279	1110100010	COMP operating current (DC)				00.00 to	00.0 to 999.9				٧	٨	Peak value[A]
282	0101100010	COMP bus voltage				00.0 to	00.0 to 999.9				٨	А	The unit is [V]
288	0000010010	COMP Operation time Upper 4 digits				0000 tc	0000 to 9999				A	А	The unit is [h]
289	1000010010	COMP Operation time Lower 4 digits				0000 tc	0000 to 9999				٧	٨	
*1 A: T	he condition of eit	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	ndividually. B: T	he condition of t	the entire refrigerant system is displayed	erant system is	displayed.						

HWE13080 - 337 -

Data before error

1734567890 Hem LD2 LD3 LD4 LD5 LD6 LD6 LD7 LD8 LD8 LD7 LD8 LD7 LD8 LD7 LD8 LD8 LD8 LD8 LD8 LD9 LD9	-													
COMP number of start-of story stop events stop events stop events stop events stop events stop events at part 4 digits LD4 LD5 LD5 LD6 LD7 LD8 OC OC OC COMP number of start- stop events stop events stop events stop events limited operation time of compressor (for time of compressor (for time of compressor (for time of compressor)) A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A<	SW4 (Whe 10 is set	nSW6- to OFF)					Dis	play				구 공 유	;; t	Remarks
COMP number of start- stop events COunt-up at start-up byper 4 digits Count-up at start-up A A The unit is [Time] COMP number of start- stop events stop events stop events Lower 4 digits Lower 4 digits Integrated operation time of compressor (for time of compressor (for tradation purpose) A A A A The unit is [h]	123456	37890		LD1	LD2	FD3	LD4	FD5	PDP	LD7	FD8	၁၀	SO	
COMP number of start-stop events A A A A A A A A A A A A Bigs The unit is [h] The unit is [h] A A Bigs A A Bigs A A Bigs A A Bigs	01100	10010	COMP number of start- stop events Upper 4 digits				0000 t	6666 0				∢		Count-up at start-up The unit is [Time]
Integrated operation time of compressor (for rotation purpose) The unit is [h] The unit is [h]	11100	10010	COMP number of start- stop events Lower 4 digits				0000 t	to 9999				∢	∢	
	00110	10010	Integrated operation time of compressor (for rotation purpose)				0000 t	to 9999				В		The unit is [h]

_
0
Ě
Φ
Б
ō
₫
•
ta
æ
\sim

Data b	Data before error												
No.	SW4 (When SW6 - 10 is set to OFF)	Item				Display	olay				Unit (A, B)*1	it 3)*1	Remarks
	1234567890		LD1	LD2	FD3	LD4	FD5	9Q7	LD7	FD8	00	SO	
301	1011010010	Power supply unit				OC/OS <-> Address	> Address				В		
302	0111010010	Start-up unit				OC/OS <-> Address	> Address				В		
320	0000001010	BC(Main)TH11				-99.9 to	-99.9 to 999.9				В		
321	1000001010	BC(Main)TH12				-99.9 to 999.9	6.666.0				В		
322	0100001010	BC(Main)TH15				-99.9 to	.99.9 to 999.9				В		
323	1100001010	BC(Main)TH16				-99.9 to 999.9	6.666				В		
324	0010001010	BC(Main)PS1				-99.9 to 999.9	6.666.0				В		
325	1010001010	BC(Main)PS3				-99.9 to 999.9	6.666.0				В		
330	0101001010	BC(Main)LEV1				0000 to 2000	2000				В		
331	1101001010	BC(Main)LEV3				0000 to 2000	2000				В		
332	0011001010	BC(Sub1)TH12				-99.9 to 999.9	6.666				В		
333	1011001010	BC(Sub1)TH15				-99.9 to	.99.9 to 999.9				В		
334	0111001010	BC(Sub1)LEV3				0000 to 2000	2000				В		
335	1111001010	BC(Sub2)TH12				-99.9 to	.99.9 to 999.9				В		
336	0000101010	BC(Sub2)TH15				-99.9 to 999.9	6.666				В		
337	1000101010	BC(Sub2)LEV3				0000 to 2000	2000				В		
338	0100101010	BC(Main)LEV2				0000 to 2000	2000				В		
*1 A·T	The condition of eith	*1 A. The condition of either OC or OS is displayed individually B. The condition of the entire refrinerant eystem is displayed	T.Al vilation B. T	The condition of	the entire refric	erant evetem is	heyeldsip						

A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

- 339 -

Data on indoor unit system

No.	SW4 (When SW6- 10 is set to OFF)	ltem				Disk	Display				Unit (A, B) *1	*	Remarks
	1234567890		LD1	LD2	FD3	LD4	SQT	9G7	LD7	FD8	00	SO	
351	1111101010	IC1 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666		В		Displayed alternately ev-
352	0000011010	IC2 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				ery 5 seconds
353	1000011010	IC3 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
354	0100011010	IC4 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
355	1100011010	IC5 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
356	0010011010	IC6 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
357	1010011010	IC7 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
358	0110011010	IC8 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
359	1110011010	IC9 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
360	0001011010	IC10 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
361	1001011010	IC11 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
362	01011010	IC12 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
363	1101011010	IC13 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
364	0011011010	IC14 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
365	101101101	IC15 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
366	0111011010	IC16 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
367	1111011010	IC17 Address/capacity code		1 0000	0000 to 9999			0000 to 9999	6666				
* * * *	dio to acitibaco oc	** A. The condition of either Of or OD is disabuted individually D. The condition of the entire reference entre	Ly D. Tho our	o of the	tiro rofrigoropt	acile of motorio	20,00						

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

9 LED Status Indicators on the Outdoor Unit Circuit Board

Data	Data on indoor unit system	stem											
Š	SW4 (When SW6- 10 is set to OFF)	ltem				Display	olay				Unit (A, B) *1	Ť.	Remarks
	1234567890		LD1	LD2	FD3	LD4	FD5	PDP TDP	LD7	PD8	00	SO	
368	0000111010	IC18 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 0		В		Displayed alternately ev-
369	1000111010	IC19 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (ery 5 seconds
370	0100111010	IC20 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666				
371	1100111010	IC21 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666				
372	0010111010	IC22 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
373	1010111010	IC23 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	9888				
374	0110111010	IC24 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
375	1110111010	IC25 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666				
376	0001111010	IC26 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
377	1001111010	IC27 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
378	0101111010	IC28 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
379	1101111010	IC29 Address/capacity code		0000 t	0000 to 9999			0000 tc	0000 to 9999				
380	0011111010	IC30 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
381	1011111010	IC31 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666				
382	0111111010	IC32 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
383	1111111010	IC33 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666				
384	0000000110	IC34 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	9666				
385	1000000110	IC35 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
386	0100000110	IC36 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
387	1100000110	IC37 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666				
388	0010000110	IC38 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
389	1010000110	IC39 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
390	0110000110	IC40 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666				
391	1110000110	IC41 Address/capacity code		0000 t	0000 to 9999			0000 tc	0000 to 9999				
392	0001000110	IC42 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
393	1001000110	IC43 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
394	0101000110	IC44 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
395	1101000110	IC45 Address/capacity code		0000 t	0000 to 9999			0000 to 9999	6666 (
* 1 A	The condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	ally. B: The co		the entire refrigerant system is displayed	system is disp	olayed.						

Data on indoor unit system

	•												
No.	SW4 (When SW6 - 10 is set to OFF)	ltem				Disp	Display				Unit (A, B) *1	iit 3) *1	Remarks
	1234567890		LD1	LD2	LD3	LD4	FD5	9G7	LD7	RD3	00	SO	
396	0011000110	IC46 Address/capacity code		0000	0000 to 9999			0000 t	0000 to 9999		В		Displayed alternately ev-
397	1011000110	IC47 Address/capacity code		0000	0000 to 9999			0000 t	0000 to 9999				ery 5 seconds
398	0111000110	IC48 Address/capacity code		0000	0000 to 9999			0000 t	0000 to 9999				
399	1111000110	IC49 Address/capacity code		0000	0000 to 9999			0000 t	0000 to 9999				
400	0000100110	IC50 Address/capacity code		0000	0000 to 9999			0000 t	0000 to 9999				
408	0001100110	IC1 Suction temperature				-99.9 tc	-99.9 to 999.9				В		The unit is [°C]
409	1001100110	IC2 Suction temperature				-99.9 tc	-99.9 to 999.9						
410	0101100110	IC3 Suction temperature				-99.9 tc	-99.9 to 999.9						
411	1101100110	IC4 Suction temperature				-99.9 tc	-99.9 to 999.9						
*1 A·T	The condition of eith	*1 A: The condition of either OC or OS is displayed individually B: The condition of the entire refrinerant system is displayed	IIV B. The con	dition of the e	ntire refrigerant	system is disp	haved						

9 LED Status Indicators on the Outdoor Unit Circuit Board

Ē
syste
unit
door
on ii
Data (

Data o	Data on indoor unit system	stem											
Š.	SW4 (When SW6 - 10 is set to OFF)	Item				Display	olay				Unit (A, B) *1	*	Remarks
	1234567890		LD1	LD2	FD3	LD4	FD5	PDP PDP	LD7	FD8	00	SO	
412	0011100110	IC5 Suction temperature				-99.9 tc	-99.9 to 999.9				В		The unit is [°C]
413	1011100110	IC6 Suction temperature				-99.9 to 999.9	6.666.0						
414	01111001110	IC7 Suction temperature				-99.9 tc	.99.9 to 999.9						
415	1111100110	IC8 Suction temperature				-99.9 to 999.9	6.666.						
416	0000010110	IC9 Suction temperature				-99.9 to 999.9	6.666						
417	1000010110	IC10 Suction temperature				-99.9 tc	99.9 to 999.9						
418	0100010110	IC11 Suction temperature				-99.9 to	-99.9 to 999.9						
419	1100010110	IC12 Suction temperature				-99.9 to	-99.9 to 999.9						
420	0010010110	IC13 Suction temperature				-99.9 to	.99.9 to 999.9						
421	1010010110	IC14 Suction temperature				-99.9 to	.99.9 to 999.9						
422	0110010110	IC15 Suction temperature				-99.9 to	.99.9 to 999.9						
423	1110010110	IC16 Suction temperature				-99.9 to	.99.9 to 999.9						
424	0001010110	IC17 Suction temperature				-99.9 tc	99.9 to 999.9						
425	1001010110	IC18 Suction temperature				-99.9 to	-99.9 to 999.9						
426	0101010110	IC19 Suction temperature				-99.9 to	.99.9 to 999.9						
427	1101010110	IC20 Suction temperature				-99.9 tc	.99.9 to 999.9						
428	0011010110	IC21 Suction temperature				-99.9 to 999.9	6.666.0						
429	101101110	IC22 Suction temperature				-99.9 to	.99.9 to 999.9						
430	0111010110	IC23 Suction temperature				-99.9 to	.99.9 to 999.9						
431	1111010110	IC24 Suction temperature				-99.9 to	-99.9 to 999.9						
432	0000110110	IC25 Suction temperature				-99.9 to	.99.9 to 999.9						
433	1000110110	IC26 Suction temperature				-99.9 to	.99.9 to 999.9						
434	0100110110	IC27 Suction temperature				-99.9 to 999.9	6.666						
435	1100110110	IC28 Suction temperature				-99.9 to	-99.9 to 999.9						
*1 A: T	The condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed	ally. B: The cor	ndition of the er	ntire refrigerant	system is disp	layed.						

HWE13080 - **343** -

Data on indoor unit system

Data o	Data on indoor unit system	Stern									•	
No.	SW4 (When SW6 - 10 is set to OFF)	ltem				Display	>			Unit (A, B) *1	<u>*</u>	Remarks
	1234567890	1	LD1	LD2	LD3	LD4	LD5	LD6 LD7	LD8	20	SO	
436	0010110110	IC29 Suction temperature				-99.9 to 999.9	6.66			В		The unit is [°C]
437	1010110110	IC30 Suction temperature				-99.9 to 999.9	6.66					
438	0110110110	IC31 Suction temperature				-99.9 to 999.9	6.66					
439	1110110110	IC32 Suction temperature				-99.9 to 999.9	6.66					
440	0001110110	IC33 Suction temperature				-99.9 to 999.9	6.66					
441	1001110110	IC34 Suction temperature				-99.9 to 999.9	6.66					
442	0101110110	IC35 Suction temperature				-99.9 to 999.9	6.66					
443	1101110110	IC36 Suction temperature				-99.9 to 999.9	6.66					
444	0011110110	IC37 Suction temperature				-99.9 to 999.9	6.66					
445	1011110110	IC38 Suction temperature				-99.9 to 999.9	6.66					
446	01111110110	IC39 Suction temperature				-99.9 to 999.9	6.66					
447	1111110110	IC40 Suction temperature				-99.9 to 999.9	6.66					
448	0000001110	IC41 Suction temperature				-99.9 to 999.9	6.66					
449	1000001110	IC42 Suction temperature				-99.9 to 999.9	6.66					
450	0100001110	IC43 Suction temperature				-99.9 to 999.9	6.66					
451	1100001110	IC44 Suction temperature				-99.9 to 999.9	6.66					
452	0010001110	IC45 Suction temperature				-99.9 to 999.9	6.66					
453	1010001110	IC46 Suction temperature				-99.9 to 999.9	6.66					
454	0110001110	IC47 Suction temperature				-99.9 to 999.9	6.66					
455	1110001110	IC48 Suction temperature				-99.9 to 999.9	6.66					
456	0001001110	IC49Suction temperature				-99.9 to 999.9	6.66					
457	1001001110	IC50 Suction temperature				-99.9 to 999.9	6.66					
458	0101001110	IC1 Liquid pipe temperature				-99.9 to 999.9	6.66			В		The unit is [°C]
459	1101001110	IC2 Liquid pipe temperature				-99.9 to 999.9	6.66					
460	0011001110	IC3 Liquid pipe temperature				-99.9 to 999.9	6.66					
461	1011001110	IC4 Liquid pipe temperature				-99.9 to 999.9	6.66					
462	0111001110	IC5 Liquid pipe temperature				-99.9 to 999.9	6.66					
463	1111001110	IC6 Liquid pipe temperature				-99.9 to 999.9	6.66					
*1 A: T	he condition of eit	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	lly. B: The cond	ition of the enti	re refrigerant	the entire refrigerant system is displayed	yed.					

9 LED Status Indicators on the Outdoor Unit Circuit Board

Ε
t syste
runit
ndoo
a on i
Dat

Data o	Data on indoor unit system	stem				
O	SW4 (When SW6- 10 is set to OFF)	ltem	Display		Unit (A, B) *1	Remarks
	1234567890		LD1 LD2 LD3 LD4 LD5 LD6 LD7	PD8	00 00	
464	0000101110	IC7 Liquid pipe temperature	-99.9 to 999.9		В	The unit is [°C]
465	1000101110	IC8 Liquid pipe temperature	6.999 ot 9.99-			
466	0100101110	IC9 Liquid pipe temperature	99.90 to 999.9			
467	1100101110	IC10 Liquid pipe temperature	99.99 ot 999.9			
468	0010101110	IC11 Liquid pipe temperature	99.99 ot 999.9			
469	1010101110	IC12 Liquid pipe temperature	99.99 ot 999.9			
470	0110101110	IC13 Liquid pipe temperature	99.99 ot 999.9			
471	1110101110	IC14 Liquid pipe temperature	99.99 to 999.9			
472	0001101110	IC15 Liquid pipe temperature	99.99 ot 999.9			
473	1001101110	IC16 Liquid pipe temperature	99.99 ot 999.9			
474	0101101110	IC17 Liquid pipe temperature	9.999 to 999.9			
475	1101101110	IC18 Liquid pipe temperature	99.90 ot 999.9			
476	0011101110	IC19 Liquid pipe temperature	9.999 ot 999.9			
477	1011101110	IC20 Liquid pipe temperature	99.99 ot 999.9			
478	01111011110	IC21 Liquid pipe temperature	9.999 to 999.9			
479	1111101110	IC22 Liquid pipe temperature	9.999 ot 99.99			
480	0000011110	IC23 Liquid pipe temperature	99.99 ot 999.9			
481	1000011110	IC24 Liquid pipe temperature	99.99 ot 999.9			
482	0100011110	IC25 Liquid pipe temperature	99.99 ot 999.9			
483	1100011110	IC26 Liquid pipe temperature	99.99 to 999.9			
484	0010011110	IC27 Liquid pipe temperature	6.999 ot 9.99-			
485	1010011110	IC28 Liquid pipe temperature	9.999 ot 99.99			
486	0111001110	IC29 Liquid pipe temperature	9.999 ot 999.9			
487	1110011110	IC30 Liquid pipe temperature	9.999 ot 999.9			
488	0001011110	IC31 Liquid pipe temperature	9.999 ot 999.9			
489	1001011110	IC32 Liquid pipe temperature	6:666 a) 6:66-			
490	0101011110	IC33 Liquid pipe temperature	6:666 a) 6:66-			
491	1101011110	IC34 Liquid pipe temperature	6.999 ot 9.99-9			
*1 A: T	he condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	ally. B: The condition of the entire refrigerant system is displayed.			

Data on indoor unit system

	f												
Š	SW4 (When SW6- 10 is set to OFF)	ltem				Dis	Display				Unit (A, B) *1	. . .	Remarks
	1234567890		LD1	LD2	FD3	LD4	FD5	PDP	LD7	FD8	00	SO	
492	001101110	IC35 Liquid pipe temperature				-99.9 t	99.9 to 999.9				В		The unit is [°C]
493	1011011110	IC36 Liquid pipe temperature				-99.9 t	.99.9 to 999.9						
494	0111011110	IC37 Liquid pipe temperature				-99.9 t	.99.9 to 999.9						
495	1111011110	IC38 Liquid pipe temperature				-99.9 t	.99.9 to 999.9						
496	0000111110	IC39 Liquid pipe temperature				-99.9 t	.99.9 to 999.9						
497	1000111110	IC40 Liquid pipe temperature				-99.9 t	-99.9 to 999.9						
498	0100111110	IC41 Liquid pipe temperature				-99.9 t	-99.9 to 999.9						
499	1100111110	IC42 Liquid pipe temperature				-99.9 t	-99.9 to 999.9						
200	0010111110	IC43 Liquid pipe temperature				-99.9 t	-99.9 to 999.9						
501	1010111110	IC44 Liquid pipe temperature				-99.9 t	.99.9 to 999.9						
502	011011110	IC45 Liquid pipe temperature				-99.9 t	.99.9 to 999.9						
203	111011110	IC46 Liquid pipe temperature				-99.9 t	-99.9 to 999.9						
504	0001111110	IC47 Liquid pipe temperature				-99.9 t	-99.9 to 999.9						
202	1001111110	IC48 Liquid pipe temperature				-99.9 t	-99.9 to 999.9						
206	0101111110	IC49 Liquid pipe temperature				-99.9 t	-99.9 to 999.9						
202	1101111110	IC50 Liquid pipe temperature				-99.9 t	-99.9 to 999.9						
* * *	14: - 3		Th. O. Th.		to on one inflore it	-111	7						

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

ū
ā
ರ
0
⊆
Ξ
ē
ഗ

Š	SW4 (When SW6 - 10 is set to OFF)	ltem				Display	olay				Unit (A, B) ^{*1}	it 3)*1	Remarks
	1234567890		LD1	LD2	LD3	LD4	SQ1	9G7	LD7	8GT	00	SO	
512	0000000001	Self-address			Alternate	display of self	Alternate display of self address and unit model	nit model			∢	∢	
513	1000000001	IC/FU address			Count-up	o display of nun	Count-up display of number of connected units	ed units			В		
514	0100000001	RC address			Count-up	o display of nun	Count-up display of number of connected units	ed units			В		
515	1100000001	BC/BS/TU address			Count-up	o display of nur	Count-up display of number of connected units	ed units					
516	001000001	OS address			Count-up	o display of nur	Count-up display of number of connected units	ed units			В		
517	1010000001	Version/Capacity		S/W version	n → Refrigerant	t type → Model	and capacity -	\rightarrow Refrigerant type \rightarrow Model and capacity \rightarrow Communication address	on address		∢	∢	
518	0110000001 OC address	OC address				OC address display	ss display					В	
*1 A:	The condition of eith	*1 A. The condition of either OC or OS is displayed individually. B: The condition of the	ndividually. B:	The condition of		entire refrigerant system is displayed	displayed.						

Data on indoor unit system

Data o	Data on Indoor unit system	stem											
Š.	SW4 (When SW6 - 10 is set to OFF)	ltem				Disl	Display				Unit (A, B) ¹	# <u>~</u>	Remarks
	1234567890		LD1	LD2	rD3	LD4	FD5	9G7	LD7	PD8	20	SO	
523	110100001	IC1 Gas pipe temperature		-		-99.9 tc	-99.9 to 999.9				В		The unit is [°C]
524	001100001	IC2 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
525	1011000001	IC3 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
526	0111000001	IC4 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
527	1111000001	IC5 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
528	0000100001	IC6 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
529	1000100001	IC7 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
530	0100100001	IC8 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
531	1100100001	IC9 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
532	0010100001	IC10 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
533	1010100001	IC11 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
534	0110100001	IC12 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
535	1110100001	IC13 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
536	0001100001	IC14 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
537	1001100001	IC15 Gas pipe temperature				-99.9 tc	.99.9 to 999.9						
538	0101100001	IC16 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
539	1101100001	IC17 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
540	0011100001	IC18 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
541	1011100001	IC19 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
542	0111100001	IC20 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
543	1111100001	IC21 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
544	0000010001	IC22 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
545	100010001	IC23 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
546	0100010001	IC24 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
547	1100010001	IC25 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
548	0010010001	IC26 Gas pipe temperature				-99.9 tc	-99.9 to 999.9						
549	1010010001	IC27 Gas pipe temperature				-99.9 to	-99.9 to 999.9						
*1 A: T	he condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	ually. B: The c	ondition of the e	the entire refrigerant system is displayed.	system is displa	ayed.						

9 LED Status Indicators on the Outdoor Unit Circuit Board

	8	=
,	•	מפונים
	•	2
	2	5
	ξ	3
	2	
	9	2
	Ċ	2

Dala o	Data on indoor unit system	stern											
No.	SW4 (When SW6- 10 is set to OFF)	ltem				Dis	Display				Unit (A, B) *1	iit 3) *1	Remarks
	1234567890		LD1	LD2	FD3	LD4	FD5	LD6	LD7	FD8	00	OS	
220	0110010001	IC28Gas pipe temperature				-99.9 t	-99.9 to 999.9				В		The unit is [°C]
551	1110010001	IC29 Gas pipe temperature				-99.9 t	-99.9 to 999.9				I		
552	0001010001	IC30 Gas pipe temperature				-99.9 t	-99.9 to 999.9				ı		
553	1001010001	IC31 Gas pipe temperature				-99.9 t	99.9 to 999.9				1		
554	0101010001	IC32 Gas pipe temperature				-99.9 t	99.9 to 999.9				1		
222	1101010001	IC33 Gas pipe temperature				-99.9 t	.99.9 to 999.9				I		
929	0011010001	IC34 Gas pipe temperature				-99.9 t	-99.9 to 999.9				ı		
222	1011010001	IC35 Gas pipe temperature				-99.9 t	99.9 to 999.9				ı		
258	0111010001	IC36 Gas pipe temperature				-99.9 t	-99.9 to 999.9				ı		
259	1111010001	IC37 Gas pipe temperature				-99.9 t	-99.9 to 999.9				I		
260	0000110001	IC38 Gas pipe temperature				-99.9 t	99.9 to 999.9				ı		
561	1000110001	IC39 Gas pipe temperature				-99.9 t	.99.9 to 999.9				I		
562	0100110001	IC40 Gas pipe temperature				-99.9 t	99.9 to 999.9						
563	1100110001	IC41 Gas pipe temperature				-99.9 t	-99.9 to 999.9				I		
564	0010110001	IC42 Gas pipe temperature				-99.9 t	-99.9 to 999.9				ı		
292	1010110001	IC43 Gas pipe temperature				-99.9 t	99.9 to 999.9				I		
999	0110110001	IC44 Gas pipe temperature				-99.9 t	.99.9 to 999.9						
292	11101110001	IC45 Gas pipe temperature				-99.9 t	-99.9 to 999.9						
268	0001110001	IC46 Gas pipe temperature				-99.9 t	99.9 to 999.9				I		
269	1001110001	IC47 Gas pipe temperature				-99.9 t	99.9 to 999.9				I		
220	0101110001	IC48 Gas pipe temperature				-99.9 t	.99.9 to 999.9				I		
571	1101110001	IC49 Gas pipe temperature				-99.9 t	-99.9 to 999.9						
572	0011110001	IC50 Gas pipe temperature				-99.9 t	99.9 to 999.9				I		
*1 A: T	The condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	ually. B: The c	ondition of the	entire refrigera	the entire refrigerant system is displayed.	ayed.						

HWE13080 - **349** -

_
_=
o
**
v.
Ó
(J)
+
=
≐
_
_
0
ō
×
⋍
.=
-=
⊆
0
_
.00
≂

Data o	Data on indoor unit system	stem										•	
Š.	SW4 (When SW6- 10 is set to OFF)	ltem				Display	olay				Unit (A, B) ^{*1}	£	Remarks
	1234567890		LD1	LD2	FD3	LD4	FD5	PD9	LD7	LD8	00	so	
573	1011110001	IC1SH				-99.9 to 999.9	6.666 (В		The unit is [°C]
574	0111110001	IC2SH				-99.9 to 999.9	6.666 (
575	1111110001	IC3SH				-99.9 to 999.9	6.666.0						
929	00000001001	IC4SH				-99.9 to 999.9	6.666.0						
212	1000001001	IC5SH				-99.9 to 999.9	989.9						
879	0100001001	IC6SH				-99.9 to 999.9	6.666.0						
629	1100001001	IC7SH				-99.9 to 999.9	6.666.0						
580	0010001001	IC8SH				-99.9 to 999.9	989.9						
581	1010001001	IC9SH				-99.9 to 999.9	6.666.0						
582	0110001001	IC10SH				-99.9 to 999.9	6.666 (
583	1110001001	IC11SH				-99.9 to 999.9	6.666 (
584	0001001001	IC12SH				-99.9 to 999.9	989.9						
585	1001001001	IC13SH				-99.9 to 999.9	6.666 (
586	0101001001	IC14SH				-99.9 to 999.9	6.666 (
287	1101001011	IC15SH				-99.9 to 999.9	6.666 (
588	0011001001	IC16SH				-99.9 to 999.9	6.666 (
589	1011001001	IC17SH				-99.9 to 999.9	6.666 (
290	0111001001	IC18SH				-99.9 to 999.9	6.666 (
591	1111001001	IC19SH				-99.9 to 999.9	6.666 (
592	0000101001	IC20SH				-99.9 to 999.9	6.666 (
593	1000101001	IC21SH				-99.9 to 999.9	6.666 (
594	0100101001	IC22SH				-99.9 to 999.9	6.666 (
262	1100101001	IC23SH				-99.9 to 999.9	6.666 (
969	0010101001	IC24SH				-99.9 to 999.9	989.9						
269	1010101001	IC25SH				-99.9 to 999.9	6.666 (
598	0110101001	IC26SH				-99.9 to 999.9	6.666 (
599	1110101011	IC27SH				-99.9 to 999.9	6.666 (
*1 A: T	ne condition of eith	11 A: The condition of either OC or OS is displayed individually. B: The condition of	ndividually. B:		the entire refrig	the entire refrigerant system is displayed.	displayed.						

9 LED Status Indicators on the Outdoor Unit Circuit Board

system
. nnit
indoor
5
Data

	. [•	
o N	SW4 (When SW6- 10 is set to OFF)	ltem				Dis	Display				Unit (A, B)*1	t ,*(Remarks
	1234567890		LD1	LD2	FD3	LD4	FD5	PD9	LD7	PD8	00	SO	
009	0001101001	IC28SH				1 6:66-	-99.9 to 999.9				В		The unit is [°C]
601	1001101001	IC29SH				16:66-	-99.9 to 999.9						
602	0101101001	ІС308Н				16:66-	-99.9 to 999.9						
603	1101101001	IC31SH				16.66-	.99.9 to 999.9						
604	0011101001	IC32SH				16:66-	.99.9 to 999.9						
909	10111101001	IC33SH				1 6:66-	-99.9 to 999.9						
909	0111101001	IC34SH				16:66-	-99.9 to 999.9						
209	1111101001	IC35SH				16:66-	-99.9 to 999.9						
809	0000011001	IC36SH				16:66-	-99.9 to 999.9						
609	1000011001	IC37SH				16:66-	99.9 to 999.9						
610	0100011001	IC38SH				1 6:66-	.99.9 to 999.9						
611	1100011001	IC39SH				16:66-	-99.9 to 999.9						
612	0010011001	IC40SH				1 6:66-	-99.9 to 999.9						
613	1010011001	IC41SH				1 6:66-	-99.9 to 999.9						
614	0110011001	IC42SH				16:66-	99.9 to 999.9						
615	1110011001	IC43SH				16:66-	.99.9 to 999.9						
616	0001011001	IC44SH				16:66-	-99.9 to 999.9						
617	1001011001	IC45SH				1 6:66-	-99.9 to 999.9						
618	0101011001	IC46SH				16.66-	-99.9 to 999.9						
619	1101011001	IC47SH				16:66-	-99.9 to 999.9						
620	0011011001	IC48SH				16:66-	.99.9 to 999.9						
621	1011011001	IC49SH				-99.9	.99.9 to 999.9						
622	0111011001	IC50SH				1 6:66-	-99.9 to 999.9						
**	he condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of t	individually B.	The condition of	f the entire ret	the entire refrigerant system is displayed	pevelusip :						

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

Data on indoor unit system

Data o	Data on indoor unit system SW4 (When SW6 -	stem				Ë	<u> </u>				Ē	+	
Š.	10 is set to OFF)	ltem				Display	olay				(A, B)*1)*1	Remarks
	1234567890		LD1	LD2	FD3	LD4	FD5	PD0	ZQ7	FD8	00	SO	
623	1111011001	IC1SC				-99.9 to 999.9	6:666				В		The unit is [°C]
624	0000111001	IC2SC				-99.9 to 999.9	6.666						
625	1000111001	IC3SC				-99.9 to 999.9	6.999.9						
979	0100111001	IC4SC				-99.9 to 999.9	6.999.9						
627	1100111001	ICSSC				-99.9 to 999.9	6.666.0						
628	0010111001	IC6SC				-99.9 to 999.9	6.999.9						
629	1010111001	IC7SC				-99.9 to 999.9	6.666.0						
089	0110111001	IC8SC				-99.9 to 999.9	6.666.0						
631	1110111001	COSC				-99.9 to 999.9	6.666 0						
632	0001111001	IC10SC				-99.9 to 999.9	6.666 0						
633	1001111001	IC11SC				-99.9 to 999.9	6.666.0						
634	0101111001	IC12SC				-99.9 to 999.9	6.666 0						
635	11011111001	IC13SC				-99.9 to 999.9	6.666.0						
989	0011111001	IC14SC				-99.9 to 999.9	6.666.0						
637	1011111001	IC15SC				-99.9 to 999.9	6.999.9						
638	0111111001	IC16SC				-99.9 to 999.9	6.666.0						
629	1111111001	IC17SC				-99.9 to 999.9	6.999.9						
640	0000000101	IC18SC				-99.9 to 999.9	6.666.0						
641	1000000101	IC19SC				-99.9 to 999.9	6.999.9						
642	0100000101	IC20SC				-99.9 to 999.9	6.666.0						
643	1100000101	IC21SC				-99.9 to 999.9	6.999.9						
644	0010000101	IC22SC				-99.9 to 999.9	6.666 0						
645	1010000101	IC23SC				-99.9 to 999.9	6.666.0						
646	0110000101	IC24SC				-99.9 to 999.9	6.666.0						
647	1110000101	IC25SC				-99.9 to 999.9	6.666 0						
648	0001000101	IC26SC				-99.9 to	-99.9 to 999.9						
649	1001000101	IC27SC				-99.9 to 999.9	6.666						
*1 A: T	ne condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed	าdividually. B: ไ	The condition of the	he entire refrige	rant system is c	displayed.						

9 LED Status Indicators on the Outdoor Unit Circuit Board

Ē
syste
mit
90
'n
ata o
Ω

HWE13080

Data	Data on midool dime system												
Š.	SW4 (When SW6- 10 is set to OFF)	ltem				Dis	Display				Unit (A, B) ^{*1}	t)*1	Remarks
	1234567890	T	LD1	LD2	FD3	LD4	FD5	9U7	LD7	PD8	00	SO	
650	0101000101	IC28SC				-99.9 te	-99.9 to 999.9				В		The unit is [°C]
651	1101000101	IC29SC				1 6.99.9 te	-99.9 to 999.9						
652	0011000101	IC30SC				1 6.99.9 te	-99.9 to 999.9						
653	1011000101	IC31SC				-99.9 t	-99.9 to 999.9						
654	0111000101	IC32SC				-99.9 t	.99.9 to 999.9						
655	1111000101	IC33SC				1 6.99.9 to	-99.9 to 999.9						
929	0000100101	IC34SC				1 6.99.9 te	-99.9 to 999.9						
299	1000100101	IC35SC				1 6.99.9 t	-99.9 to 999.9						
658	0100100101	1C36SC				1 6.99.9 t	-99.9 to 999.9						
629	1100100101	IC37SC				1 6.99.9 te	.99.9 to 999.9						
099	0010100101	IC38SC				-99.9 te	-99.9 to 999.9						
199	101010101	IC39SC				1 6.99.9 te	-99.9 to 999.9						
662	0110100101	IC40SC				1 6.99.9 to	-99.9 to 999.9						
663	1110100101	IC41SC				1 6.99.9 te	-99.9 to 999.9						
664	0001100101	IC42SC				-99.9 t	-99.9 to 999.9						
999	1001100101	IC43SC				-99.9 te	-99.9 to 999.9						
999	0101100101	IC44SC				-99.9 te	-99.9 to 999.9						
299	1101100101	IC45SC				-99.9 te	-99.9 to 999.9						
899	0011100101	IC46SC				1 6.99.9 te	-99.9 to 999.9						
699	1011100101	IC47SC				1 6.99.9 t	-99.9 to 999.9						
029	0111100101	IC48SC				1 6.99.9 to	-99.9 to 999.9						
671	1111100101	IC49SC				1 6.99.9 te	-99.9 to 999.9						
672	0000010101	IC50SC				1 6.99.9 t	-99.9 to 999.9						
*1 A: T	he condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	ndividually. B: T	he condition of	the entire refrio	the entire refrigerant system is displayed	displayed.						

- 353 -

11 A: The condition of either OC or OS is displayed individually. B: The condition of the ent

	_	
i	ï	3
ĺ	į	ū
7	C	j
	_	
į	C	2
	c	
3		
3	F	j
1	٥	ľ

setting data	data												
O	SW4 (When SW6- 10 is set to OFF)	ltem				Display	olay				Unit (A, B) ^{*1}	it ;)*1	Remarks
	1234567890	T	LD1	LD2	FD3	LD4	FD5	PDP	LD7	PD8	00	SO	
929	0010010101	INV board S/W version				0.00 to	0.00 to 99.99				∢	4	
629	111001011	Fan board (address 5) S/W version				0.00 to	0.00 to 99.99				∢	∢	
889	0000110101	Current time				00:00 tc	00:00 to 23:59				∢	∢	Hour: minute
689	1000110101	Current time -2				00.00 to 99.12/1 to 31	12/1 to 31						Year and month, and date alternate display
069	0100110101	Time of error detection 1				00:00 tc	00:00 to 23:59						Hour: minute
691	1100110101	Time of error detection 1-2				00.00 to 99.12/1 to 31).12/1 to 31						Year and month, and date alternate display
692	0010110101	Time of error detection 2				00:00 tc	00:00 to 23:59						Hour: minute
693	1010110101	Time of error detection 2-2				00.00 to 99.12/1 to 31	12/1 to 31						Year and month, and date alternate display
694	0110110101	Time of error detection 3				00:00 tc	00:00 to 23:59						Hour: minute
695	1110110101	Time of error detection 3-2				00.00 to 99.12/1 to 31	3.12/1 to 31						Year and month, and date alternate display
969	0001110101	Time of error detection 4				00:00 tc	00:00 to 23:59						Hour: minute
269	100111001	Time of error detection 4-2				00.00 to 99.12/1 to 31	3.12/1 to 31						Year and month, and date alternate display
869	0101110101	Time of error detection 5				00:00 tc	00:00 to 23:59						Hour: minute
669	1101111011	Time of error detection 5-2				00.00 to 99.12/1 to 31	1.12/1 to 31						Year and month, and date alternate display
700	0011110101	Time of error detection 6				00:00 tc	00:00 to 23:59						Hour: minute
701	101111101	Time of error detection 6-2				00.00 to 99.12/1 to 31).12/1 to 31						Year and month, and date alternate display
i			1										

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

æ
Ħ
<u></u>
ъ
_
ō
_
₻
بيد
Φ
ഗ

				ate		ate		ate		ate		ate
	Remarks		Hour: minute	Year and month, and date alternate display	Hour: minute	Year and month, and date alternate display	Hour: minute	Year and month, and date alternate display	Hour: minute	Year and month, and date alternate display	Hour: minute	Year and month, and date alternate display
	iit 3)* 1	SO	А									
	Unit (A, B) ^{* 1}	20	Α									
		FD8										
		2 07										
		PD7										
	Display	FD5	00:00 to 23:59	00.00 to 99.12/1 to 31	00:00 to 23:59	00.00 to 99.12/1 to 31	00:00 to 23:59	00.00 to 99.12/1 to 31	00:00 to 23:59	00.00 to 99.12/1 to 31	00:00 to 23:59	00.00 to 99.12/1 to 31
	Dis	LD4	00:00	00.00 to 99	00:00	00.00 to 99	00:00	00.00 to 99	00:00	00.00 to 99	00:00	00.00 to 99
		FD3										
		LD2										
		LD1										
	Item		Time of error detection 7	Time of error detection 7-2	Time of error detection 8	Time of error detection 8-2	Time of error detection 9	Time of error detection 9-2	Time of error detection 10	Time of error detection 10-2	Time of last data backup before error	Time of last data backup before error -2
data	SW4 (When SW6- 10 is set to OFF)	1234567890	0111110101	1111110101	0000001101	1000001101	0100001101	1100001101	0010001101	1010001101	0110001101	1110001101
Setting data	Š.	ı	702	703	704	202	902	707	208	602	710	711
HWE ²	13080											- 355 -

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

Data on indoor unit system

Data o	Data on indoor unit system	stem											
Š	SW4 (When SW6 - 10 is set to OFF)	ltem				Dis	Display				Unit (A, B) [*] 1)* 1	Remarks
	1234567890		LD1	LD2	FD3	LD4	FD5	9U7	LD7	FD8	00	so	
714	0101001101	IC1 LEV opening				0000	0000 to 9999		-		В		Fully open: 2000
715	1101001101	IC2 LEV opening				0000	0000 to 9999						
716	0011001101	IC3 LEV opening				0000	0000 to 9999						
717	1011001101	IC4 LEV opening				0000	0000 to 9999						
718	0111001101	IC5 LEV opening				0000	0000 to 9999						
719	1111001101	IC6 LEV opening				0000	0000 to 9999						
720	0000101101	IC7 LEV opening				0000	0000 to 9999						
721	1000101101	IC8 LEV opening				0000	0000 to 9999						
722	0100101101	IC9 LEV opening				0000	0000 to 9999						
723	1100101101	IC10 LEV opening				0000	0000 to 9999						
724	0010101101	IC11 LEV opening				0000	0000 to 9999						
725	1010101101	IC12 LEV opening				0000	0000 to 9999						
726	0110101101	IC13 LEV opening				0000	0000 to 9999						
727	1110101101	IC14 LEV opening				0000	0000 to 9999						
728	0001101101	IC15 LEV opening				0000	0000 to 9999						
729	1001101101	IC16 LEV opening				0000	0000 to 9999						
730	0101101101	IC17 LEV opening				0000	0000 to 9999						
731	1101101101	IC18 LEV opening				0000	0000 to 9999						
732	0011101101	IC19 LEV opening				0000	0000 to 9999						
733	1011101101	IC20 LEV opening				0000	0000 to 9999						
734	0111101101	IC21 LEV opening				0000	0000 to 9999						
735	1111101101	IC22 LEV opening				0000	0000 to 9999						
736	0000011101	IC23 LEV opening				0000	0000 to 9999						
737	1000011101	IC24 LEV opening				0000	0000 to 9999						
738	0100011101	IC25 LEV opening				0000	0000 to 9999						
739	1100011101	IC26 LEV opening				0000	0000 to 9999						
740	0010011101	IC27 LEV opening				0000	0000 to 9999						
*1 A: T	he condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed	ndividually. B:	The condition of	the entire refr	igerant system is	s displayed.						

- 356 -

9 LED Status Indicators on the Outdoor Unit Circuit Board

Ε
/ste
it s
run
9
'n
ıta o
Da

Data o	Data on Indoor unit system	/stem										
Š.	SW4 (When SW6 - 10 is set to OFF)	Item				Display				Unit (A, B)*1	it)* 1	Remarks
	1234567890		LD1	LD2	LD3 LD4	FD5	9CT	LD7	PD8	00	SO	
741	1010011101	IC28 LEV opening			0	0000 to 9999				В		Fully open: 2000
742	0110011101	IC29 LEV opening			D	0000 to 9999						
743	1110011101	IC30 LEV opening			D	0000 to 9999						
744	0001011101	IC31 LEV opening			0	0000 to 9999						
745	1001011101	IC32 LEV opening			0	0000 to 9999						
746	0101011101	IC33 LEV opening			0	0000 to 9999						
747	1101011101	IC34 LEV opening			0	0000 to 9999						
748	0011011101	IC35 LEV opening			ס	0000 to 9999						
749	1011101101	IC36 LEV opening			D	0000 to 9999						
750	0111011101	IC37 LEV opening			D	0000 to 9999						
751	1111011101	IC38 LEV opening			0	0000 to 9999						
752	0000111101	IC39 LEV opening			ס	0000 to 9999						
753	1000111101	IC40 LEV opening			D	0000 to 9999						
754	0100111101	IC41 LEV opening			D	0000 to 9999						
755	1100111101	IC42 LEV opening			ס	0000 to 9999						
756	0010111101	IC43 LEV opening			ס	0000 to 9999						
757	1010111101	IC44 LEV opening			D	0000 to 9999						
758	0110111101	IC45 LEV opening			ס	0000 to 9999						
759	1110111101	IC46 LEV opening			0	0000 to 9999						
260	0001111101	IC47 LEV opening			0	0000 to 9999						
761	1001111101	IC48 LEV opening			D	0000 to 9999						
762	0101111101	IC49 LEV opening			D	0000 to 9999						
763	1101111101	IC50 LEV opening			ס	0000 to 9999						
764	0011111101	IC1 Operation mode								В		
292	1011111101	IC2 Operation mode										
992	0111111101	IC3Operation mode		0000 : Sto	Stop 0001: Ventilation 0002: Cooling 0003: Heating 0004: Dry	0002 : Cooling 000	3 : Heating 0004 :	Dry				
167	1111111101	IC4 Operation mode										
292	0000000011	IC5 Operation mode										
*1 A: T	he condition of eit	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	ndividually. B:		the entire refrigerant system is displayed	em is displayed.						

E
yst
it s
E
ŏ
bg
Ĕ
ā
ā

Data o	Data on indoor unit system	stem											
o N	SW4 (When SW6- 10 is set to OFF)	ltem				_	Display				⊃ (<u></u>	Unit (A, B) ^{*1}	Remarks
	1234567890	1	LD1	LD2	EQ7	LD4	TD5	9U7	LD7	PLD8	00	SO	
692	100000011	IC6 Operation mode									В		
770	0100000011	IC7 Operation mode											
771	110000011	IC8 Operation mode	T										
772	0010000011	IC9 Operation mode											
773	101000011	IC10 Operation mode											
774	0110000011	IC11 Operation mode											
775	1110000011	IC12 Operation mode											
9//	000100011	IC13 Operation mode											
777	100100011	IC14 Operation mode											
778	0101000011	IC15 Operation mode											
622	110100011	IC16 Operation mode											
780	0011000011	IC17 Operation mode	.										
781	1011000011	IC18 Operation mode											
782	0111000011	IC19 Operation mode		. 0000		Stan 0001 - Vantilation 0002 - Cadina 0003 - Heating 0004 - Dry) pailoo) . SO() paited : FOOr	, a.C				
783	1111000011	IC20 Operation mode					900 . 500	, i i eating					
784	0000100011	IC21 Operation mode											
785	1000100011	IC22 Operation mode											
982	0100100011	IC23 Operation mode											
787	110010011	IC24 Operation mode											
788	0010100011	IC25 Operation mode											
789	1010100011	IC26 Operation mode											
790	0110100011	IC27 Operation mode											
791	1110100111	IC28 Operation mode											
792	0001100011	IC29 Operation mode											
793	1001100011	IC30 Operation mode											
794	0101100011	IC31 Operation mode											
262	11011100011	IC32 Operation mode											
962	0011100011	IC33 Operation mode											
*1 A: T	he condition of eitl	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	individually. B: T			the entire refrigerant system is displayed	n is displayed.						

- 358 -

9 LED Status Indicators on the Outdoor Unit Circuit Board

Data on indoor unit system

Data o	Data on indoor unit system	rstem								-		•	
Š.	SW4 (When SW6- 10 is set to OFF)	ltem				Dis	Display				Unit (A, B) ^{*1})*1	Remarks
	1234567890	Ī	LD1	LD2	FD3	LD4	FD5	PD0	LD7	PD8	00	SO	
797	1011100011	IC34 Operation mode									В		
798	0111100011	IC35 Operation mode											
799	1111100011	IC36 Operation mode											
800	0000010011	IC37 Operation mode											
801	1000010011	IC38 Operation mode											
802	0100010011	IC39 Operation mode											
803	1100010011	IC40 Operation mode											
804	0010010011	IC41 Operation mode											
805	1010010011	IC42 Operation mode		3:0000	Stop 0001 : V€	entilation 0002	0000 : Stop 0001 : Ventilation 0002 : Cooling 0003 : Heating 0004 : Dry	: Heating 000	4 : Dry				
908	0110010011	IC43 Operation mode											
807	11100100111	IC44 Operation mode											
808	0001010011	IC45 Operation mode											
809	1001010011	IC46 Operation mode											
810	0101010011	IC47 Operation mode											
811	110101011	IC48 Operation mode											
812	0011010011	IC49 Operation mode											
813	1011010111	IC50 Operation mode											
814	0111010011	IC1 filter				0000 t	0000 to 9999				В		Hours since last mainte-
815	1111010111	IC2 filter				0000 t	0000 to 9999						nance [n]
816	0000110011	IC3 filter				0000 t	0000 to 9999						
817	1000110011	IC4 filter				0000 t	0000 to 9999						
818	0100110011	IC5 filter				0000 t	0000 to 9999						
819	1100110011	IC6 filter				0000 t	0000 to 9999						
820	0010110011	IC7 filter				1 0000	0000 to 9999						
821	1010110011	IC8 filter				0000	0000 to 9999						
822	0110110011	IC9 filter				0000 t	0000 to 9999						
823	11101110111	IC10 filter				0000 t	0000 to 9999						
824	0001110011	IC11 filter				0000 t	0000 to 9999						
*1 A: T	he condition of eitl	*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.	ndividually. B: T	he condition of tl	ne entire refrig	erant system is	displayed.						

Data on indoor unit system

Data o	Data on Indoor unit system	stem											
Š	SW4 (When SW6 - 10 is set to OFF)	ltem				Display	ılay				Unit (A, B) [*] 1		Remarks
	1234567890		LD1	LD2	LD3	LD4	LD5	T PGT	1 / CD1	FD8	0 00	SO	
825	1001110011	IC12 filter				0000 to 9999	6666				В	ĭ	Hours since last mainte-
826	0101110011	IC13 filter				0000 to 9999	6666					<u> </u>	nance [n]
827	1101110011	IC14 filter				0000 to 9999	6666						
828	0011110011	IC15 filter				0000 to 9999	6666						
829	1011110011	IC16 filter				0000 to 9999	6666						
830	0111110011	IC17 filter				0000 to 9999	6666						
831	1111110011	IC18 filter				0000 to 9999	6666						
832	0000001011	IC19 filter				0000 to 9999	6666						
833	100000111	IC20 filter				0000 to 9999	6666						
834	0100001011	IC21 filter				0000 to 9999	6666						
835	110000111	IC22 filter				0000 to 9999	6666						
836	0010001011	IC23 filter				0000 to 9999	6666						
837	1010001011	IC24 filter				0000 to 9999	6666						
838	0110001011	IC25 filter				0000 to 9999	6666						
839	1110001011	IC26 filter				0000 to 9999	6666						
840	0001001011	IC27 filter				0000 to 9999	6666						
841	1001001011	IC28 filter				0000 to 9999	6666						
842	0101001011	IC29 filter				0000 to 9999	6666						
843	1101001011	IC30 filter				0000 to 9999	6666						
844	0011001011	IC31 filter				0000 to 9999	6666						
845	1011001111	IC32 filter				0000 to 9999	6666						
846	0111001001	IC33 filter				0000 to 9999	6666						
847	1111001011	IC34 filter				0000 to 9999	6666						
848	0000101011	IC35 filter				0000 to 9999	6666						
849	1000101011	IC36 filter				0000 to 9999	6666						
850	0100101011	IC37 filter				0000 to 9999	6666						
851	1100101011	IC38 filter				0000 to 9999	6666						
852	0010101011	IC39 filter				0000 to 9999	6666						
*1 A: T	he condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of	ndividually. B: 1	The condition of the	the entire refrigerant system is displayed	rant system is	displayed.						

Data on indoor unit system

No.	SW4 (When SW6- 10 is set to OFF)	Item				Disk	Display				Unit (A, B) [*] 1	t)*1	Remarks
	1234567890		ΓD1	TD2	EGT	LD4	FD5	PDP	2 07	FD8	00	SO	
853	1010101011	IC40 filter				0000 tc	0000 to 9999				В		Hours since last mainte-
854	0110101011	IC41 filter				0000 to	0000 to 9999						nance [n]
855	1110101011	IC42 filter				0000 to	0000 to 9999						
856	0001101011	IC43 filter				0000 to	0000 to 9999						
857	100110111	IC44 filter				0000 to	0000 to 9999						
828	0101101011	IC45 filter				0000 tc	0000 to 9999						
829	110110111	IC46 filter				0000 to	0000 to 9999						
860	0011101011	IC47 filter				0000 to	0000 to 9999						
861	1011110111	IC48 filter				0000 to	0000 to 9999						
862	0111101011	IC49 filter				0000 to	0000 to 9999						
863	1111101011	IC50 filter				0000 to	0000 to 9999						
*1 A: Ti	ne condition of eith	*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed	ndividually. B: T	The condition of	the entire refrig	erant system is	displayed.						

Other types of data

	ome alped of data													
No.	SW4 (When SW6- 10 is set to OFF)	ltem				Disp	Display				Unit (A, B) *1	it :) *1	Remarks	
	1234567890		LD1	LD2	FD3	LD4	SQ1	PDP	LD7	FD8	8	SO		
871	11100111	U-phase current effective value 1				-99.9 tc	-99.9 to 999.9				∢	∢	The unit is [A]	
872	0001011011	W-phase current effective value 1				-99.9 tc	-99.9 to 999.9				⋖	⋖		
873	1001011011	Power factor phase angle 1				-99.9 tc	-99.9 to 999.9				⋖	٨	The unit is [deg]	
880	0000111011	Control board Reset counter				0 to 254	254				Ą	A	The unit is [time]	
881	1000111011	INV board Reset counter				0 to 254	254				A	А		
884	110111010	Fan board (address 5) reset counter				0 to 254	254				∢	A	The unit is [time]	
*1 A. T	tio to acitibaco or	** A. The condition of either Of or Of is displayed individually B. The condition of the entire refuiences and another individual	T. O VIICINDIVID	dt to acitibace of	o ontiro rotrigor	oi motovo taca	المريراطوالم							_

*1 A: The condition of either OC or OS is displayed individually. B: The condition of the entire refrigerant system is displayed.

